SIBOGA-EXPEDITIE

Siboga-Expeditie

UITKOMSTEN

OP

ZOOLOGISCH, BOTANISCH, OCEANOGRAPHISCH EN GEOLOGISCH GEBIED

VERZAMELD IN

NEDERLANDSCH OOST-INDIË 1899—1900

AAN BOORD H. M. SIBOGA ONDER COMMANDO VAN

Luitenant ter zee 1e kl. G. F. TYDEMAN

UITGEGEVEN DOOR

Dr. MAX WEBER
Em. Prof. in Amsterdam, Leider der Expeditie

(met medewerking van de Maatschappij ter bevordering van het Natuurkundig Onderzoek der Nederlandsche Koloniën)

LEIDEN
E. J. BRILL
1934

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THE

COPEPODA OF THE SIBOGA EXPEDITION

PART II

COMMENSAL AND PARASITIC COPEPODA

BY

W. HAROLD LEIGH-SHARPE
Lecturer in Zoology, University of London

With 39 text-figures

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Systematic	4
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EXPLANATION OF THE LETTERING OF THE FIGURES

A. = Abdomen.
A.A. = Abdominal appendages,
A.1. = Antennules.
A.2. = Antennae.
B. = Bulla.
C. = Cephalothorax.
C.B. = Cephalic barbs.
D.L. = Dorsal lamina.
En. = Endopodite.
Ex. = Exopodite.
F. = Furca.
G. = Genital segment.
G.P. = Genital process.
H. = Maxillary hook.
L. = Lunules.
L.L. = Lower lip.
M. = Mouth.
M.C. = Mouth cone.
Mn. = Mandibles.
Mp. = Maxillipedes.
Mx.1. = First maxillae.
Mx.2. = Second maxillae.
Od. = Aperture of Oviduct.
Os. = Ovisacs (eggstrings).
P. = Pereiopods.
U.L. = Upper lip.
♂. = Male.
♀. = Female.

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PREFACE

My best thanks are due to Prof. MAX WEBER for allowing me to examine the collection, to Miss EDITH C. HUMPHREYS for executing the figures and to Dr C. L. OAKLEY for his general assistance particularly with the commensal forms and the Chondracanthidae.

The type specimens are all preserved in the Museum of Amsterdam.

The slides are mounted in euparal.

Since thirty-four years have elapsed between the collection and the examination of the specimens it is not surprising that some have disintegrated or are in a decomposed or damaged condition, especially the commensals. The larger forms have been too roughly removed from their hosts, particularly the Chondracanthidae and the Lernaeidae, so that in the former case most of the appendages and in the latter the entire heads have been torn off.

It is remarkable that hardly any of the specimens bear eggstrings, but in every instance in which they are present they have been figured.

Dimensions of parts of each animal have not been given as in each case the entire animal is drawn to scale.

CLASSIFICATION

The order Copepoda is divided in the following work according to the system of OAKLEY 1930 into two suborders as follows:

I. Suborder CYCLOPIFORMES

To include: all free-swimming and commensal families, and the parasitic families Ergasilidae, Juanettidae and Chondracanthidae.

One or both sexes cyclopoid, that is inflated, with non-suctorial mouth, simple or falciform mandibles, relatively small genital segment, no frontal filament.

II. Suborder CALIGIFORMES

To include the parasitic families Caligidae, Dichelesthiidae, Lernaeidae, Lernaeopodidae, Choniostomatidae, Herpyllobiidae etc.

One or both sexes or larva caligoid, that is dorsiventrally flattened, with suctorial mouth tube, styliform mandibles, large genital segment, frontal filament present except in the sub-family Euryphorinae.

SYSTEMATIC

The collection comprises thirty-eight species belonging to twenty-nine genera and distributed among thirteen families:

CYCLOPIFORMES

NOTODELPHYIDAE

I. **Lamippe?** Bruzelius

1.

II. **Notodelphys** Allman

2. *N. matronalis* n. sp.

BOTRYLLOPHILIDAE

III. **Parabotryllophilus** n. g.

3. *P. arrisio* n. sp.

MANTRIDAE

IV. **Mantra** n. g.

4. *M. speciosa* n. sp.

ASCOMYZONTIDAE

V. **Mimacheres** n. g.

5. *M. collyra* n. sp.

LICHOMOLGIDAE

VI. **Lichomolgus** Thorell

6. *L. brevicaudis* n. sp.

7. Genus and species indeterminable.

ERGASILIDAE

Bomolochus Nordmann

8. *B. efficatus* n. sp.

CHONDRACANTHIDAE

VIII. **Humphreysia** n. g.

9. *H. floreata* n. sp.

IX. **Immanthe** n. g.

10. *I. campanulata* n. sp.

X. **Scheherazade** n. g.

11. *S. scheherazade* n. sp.

CALIGIFORMES

CALIGIDAE

XI. **Caligus** Müller

12. *C. dubius* Scott

13. *C. eventilis* n. sp.

14. *C. mirabilis* n. sp.

15. *C. mordax* n. sp.

XII. **Lepeophtheirus** Nordmann

16. *L. perpes* n. sp.

XIII. **Pandarus** Leach

17. *P. cranchii* Leach
18. *P. smithii* Rathbun

XIV. **Nesippus** Heller

19. *N. curticaudis* (Dana)

XV. **Perissopus** Steenstrup & Lütken

20. *P. communis* Rathbun

XVI. **Alebion** Krøyer

21. *A. carchariae* Krøyer

XVII. **Dysgamus** Steenstrup & Lütken

22. *D. murrayi* (Brady)

DICHELESTHIIDAE

XVIII. **Peniculisa** Wilson

23. *P. furcata* (Krøyer)

XIX. **Piratasta** n. g.

24. *P. virgatula* n. sp.

VENTRICULINIDAE

XX. **Heliogabalus** n. g.

25. *H. pulvauratus* n. sp.

LERNAEIDAE

XXI. **Lernaea?** Linnaeus

26.

XXII. **Lernaeenicus** Le Sueur

27. *L. gnathonicus* n. sp.
28. *L. gnavus* n. sp.
29. *L.* ? sp.

XXIII. **Peniculus** Nordmann

30. *P. elegans* n. sp.
31. *P. communis* n. sp.

XXIV. **Thanatodectes** n. g.

32. *T. semaphorus* n. sp.

XXV. **Sarcotretes** Jungersen

33. *S. eristaliformis* (Brian)
34. *S. scopeli* Jungersen

XXVI. **Cardiodectes** Wilson

35. *C. rubosus* n. sp.

XXVII. **Haemobaphes** Steenstrup & Lütken

36. *H. dilectus* n. sp.

SPHYRIIDAE

XXVIII. **Rebelula** Poche

37. *R. cardusa* n. sp.

LERNAEOPODIDAE

XXIX. **Brachiella** Cuvier

38. *B. superba* n. sp.

Together with three free-swimming forms in the Appendix.

CALANIDAE	ARTOTROGIDAE	CORYCAEIDAE
Bathycalanus Sars	**Artotrogus** Boeck	**Saphirella** Scott
B. richardi Sars	*A. abyssicolus* Scott	*S. abyssicola* Scott

Of the above nine genera and twenty-six species are new to science.

The present author (1930 Rés. scient. Voy. Indes orient néerl. LL. AA. RR. le Prince et la Princesse Léopold de Belgique. Mém. Mus. roy. Hist. nat. Belg. Hors série, Vol III fasc. 2, 11 p., 5 pl.) has already described from the same area:

Parasite	Host
Pseudocycnus appendiculatus Heller	*Euthynnus yaito* Kishinouye
Perissopus crenatus n. sp.	*Carcharinus borneensis* (Bleeker)
Caligus regalis n. sp.	*Euthynnus yaito* Kishinouye
Thysanote sp.	*Mugil crenilabris* Forskål

None of these occurs in the present collection.

Order COPEPODA

Sub-Order CYCLOPIFORMES

Family NOTODELPHYIDAE

Lamippe Bruzelius 1858

Five tubes are present in the collection containing minute, ovoid, yellow animals, in a very decomposed condition, found in association with Alcyonarians as follows:

(*a*) *Caligorgia* sp. N° 6.

Stat. 156. 0° 29′.2 Lat. S., 130° 5′.3 Long. E. 469 M.

(*b*) *Chrysogorgia flexilis* Wright & Studer.

Stat. 87. 0° 32′ Lat. S., 119° 39′.8 Long. E. 655 M.

(*c*) *Stenella* sp. N° 1.

Stat. 297. 10° 39′ Lat. S., 123° 40′ Long. E. 520 M.

(*d*)

Stat. 251. 5° 28′.4 Lat. S., 132° 0′.2 Long. E. 204 M.

(*e*) *Caligorgia* sp. N° 1.

Stat. 251. 5° 28′.4 Lat. S., 132° 0′.2 Long. E. 204 M.

One specimen in (*e*) shows a two-articled antennule and a three-articled antenna suggestive of *Lamippe*.

Notodelphys Allman 1847

1. *Notodelphys matronalis* n. sp.

(*a*) Commensal in *Ascidia rhabdophora* Sluiter.

Locality: Stat. 144. Salomakië, Anchorage. 55 M.

Material: 2 ♀♀ (Figs. 1 and 2).

(*b*) Commensal in *Styela asymmetrica* Sluiter.

Location: Branchial cavity.

Locality: Stat. 149. Gebé Island. 31 M.

Material: 1 ♀.

Diagnosis: Body elongated. Carapace curved ventrally anteriorly. Head fused with first thoracic segment. Trunk with second and third segments free, separated by deep lateral sinuses. Fourth and fifth segments fused, elongated, with dorsal brood-pouch.

Abdomen narrow, cylindrical, of four segments; appendages much longer than wide terminating in two long setae.

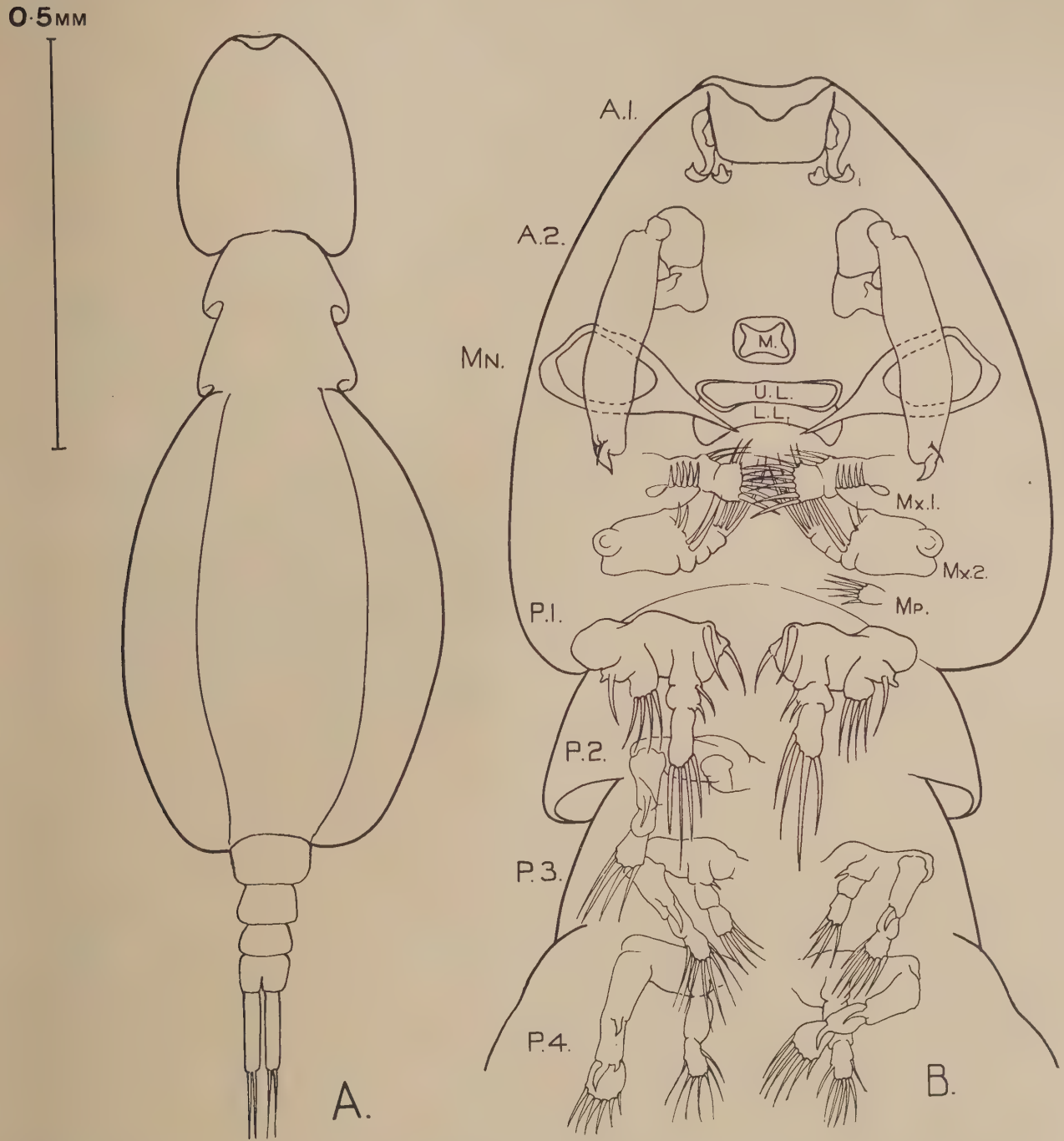

Fig. 1. *Notodelphys matronalis* n. sp. ♀. A. Ventral aspect. B. Ventral aspect, enlarged view of anterior end.

Antennules torn off.

Antennae three-articled, the elongated distal article showing no traces of setae in (*a*) and ending in a claw in (*b*).

Mandibles different from those of any other species, consisting of an untoothed curved stylet on an enormously enlarged spherical base.

Upper and lower lips and mouth well marked.

First Maxillae biramous, the endopodite biarticulate; both rami ending in numerous elongated setae

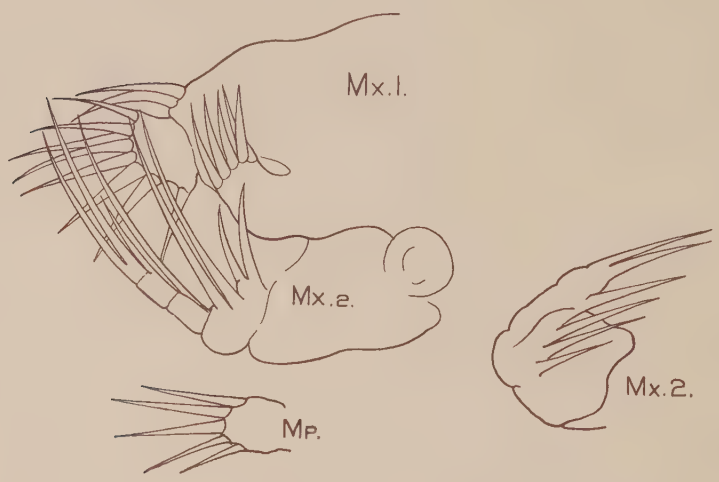

Fig. 2. *Notodelphys matronalis* n. sp. ♀. appendages.

Second maxillae large, biramous, the exopodite of several articles, both rami ending in numerous elongated setae.

Maxillipedes very small undivided setose plates.

Pereiopods four pairs, biramose, each ramus three-articled. The first pair differs from the rest as the exopodite is shorter, two-articled and bears a long seta. The proximal article of all the other exopodites bears a stout seta, and all the endopodites one or more small setae; the middle article of the fourth pair bears a small seta. The distal paddle-like articles all bear elongated setae.

I am unable to find a fifth pair of pereiopods.

The styliform mandibles resemble those of the male of *Agnathener* Canu (1892), but as no female has been described and the maxillipedes are different I hesitate to place this species in that genus.

Famiy Botryllophilidae

Parabotryllophilus n. g.

Resembling *Botryllophilus* in all general characters, but the location of the fifth pair of pereiopods far back on the genital segment posterior to the spherical brood-pouch warrants the erection of a new genus; moreover the ovisacs (or brood-pouches), which are empty, are lateral and paired.

1. *Parabotryllophilus arrisio* n. sp.

Commensal in *Styela orbicularis* Sluiter.

Locality: Stat. 316. 7° 19′.4 Lat. S., 116° 49′.5 Long. E. 538 M.

Material: 1 ♀ (Fig. 3).

Diagnosis: Anterior portion of head damaged.

Trunk with three segments demarcated anteriorly.

Antennules broken off.

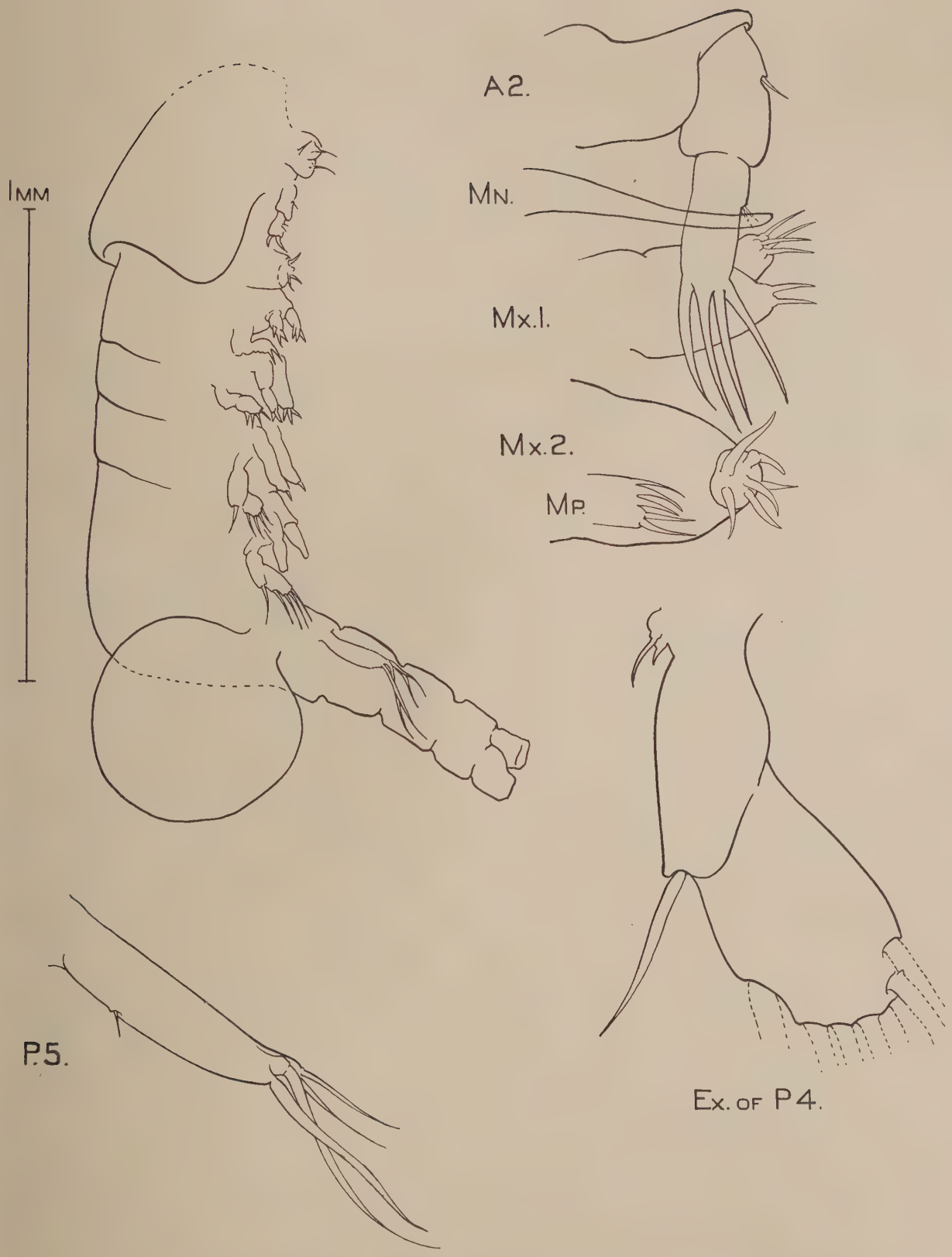

Fig. 3. *Parabotryllophilus arrisio* n. sp. ♀. Right lateral aspect and appendages.

Antennae of three articles, the two distal at right angles to the proximal, the distal article with four long terminal setae and two small lateral; the middle article with one lateral seta.

Mandibles long, curved and toothless.

Both Maxillae with unjointed exopodite and endopodite ending in long setae.

Maxillipedes small undivided setose plates.

The first four pairs of pereiopods having endopodites of two-articled stumps ending in small setae, and exopodites of biarticulated swimming paddles, the proximal with one large subterminal seta and two on a prominence near the body, the distal showing the origin of six large setae.

The fifth pair of pereiopods elongated, one-articled, with four terminal setae, two long and two short, and one small lateral seta.

Abdomen at right angles ventrally to the trunk, narrow, cylindrical, consisting of three segments; appendages short; caudal setae broken off.

The mandibles do not resemble those of *Botryllophilus*, nor the maxillipedes which are like those of *Notodelphys*.

New family Mantridae

Antennules eleven-articled gradually decreasing in size distally. Cephalothorax with rostrum. Antennae two-articled ending in two long curved spines. Mandibles primitive, biramous, with biramous exopodite. Maxillipedes slender, four-articled, ending in two long setae. Fifth pereiopods one-articled.

Mantra n. g.

1. *Mantra speciosa* n. sp.

Commensal in *Chama* sp.

Material: 1 ♀ (Fig. 4).

Diagnosis: Body elongated. Cephalothorax short with a truncated, shield-like rostrum.

Second thoracic segment (the first free) very large.

Genital segment as wide as long anteriorly, but narrowing posteriorly. Abdomen of three segments.

Abdominal appendages elongated each ending in two long and one shorter setae.

Antennules eleven-articled, the two proximal articles very large the others decreasing regularly in size to the apex, apparently devoid of setae, and ending in a minute claw.

Antennae two-articled, the basal article large and stout, the distal stout and at right angles to it, and capped with two enormously elongated setae, which appear to act together as a claw. This appendage recalls that of the Clausidiidae.

Mandibles primitive biramous, endopodite a long, pointed, toothless stylet, exopodite biramous consisting of a one-articled basal portion, and the rami undivided, flat plates bearing three and four setae respectively.

The Maxillae cannot be made out.

Maxillipedes slender, four-articled, the distal three reflexed on the basal. Apical article very small and ending in two long setae.

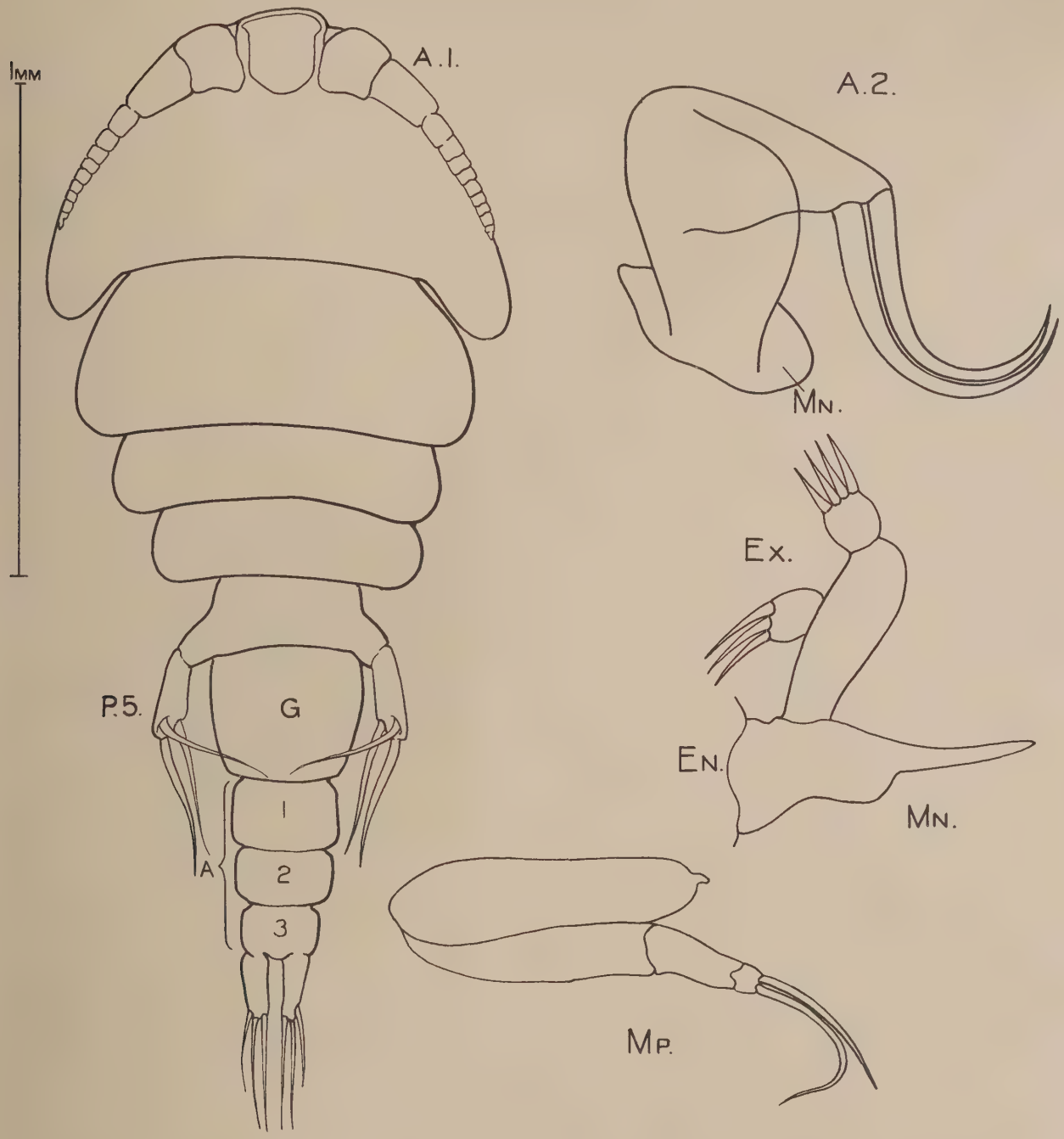

Fig. 4. *Mantra speciosa* n. sp. ♀. Ventral aspect and appendages.

Four pairs of pereiopods at least two-articled but their apices cannot be made out. Fifth pair of pereiopods one-articled, terminating in three enormous setae.

Family Ascomyzontidae

Mimacheres n. g.

1. *Mimacheres collyra* n. sp.

Host: in galls on *Errina ramosa* Hickson & England.

Locality: Stat. 297. 10° 39′ Lat. S., 123° 40′ Long. E. 520 M.

Material: 4 ♀♀ (Figs. 5 & 6).

Diagnosis: Cephalothorax hugely inflated dorsally and anteriorly, hence the specific name; much larger than the rest of the body, which is curved forward, and making it appear top-heavy. Mouth and appendages situated in the middle of the ventral surface.

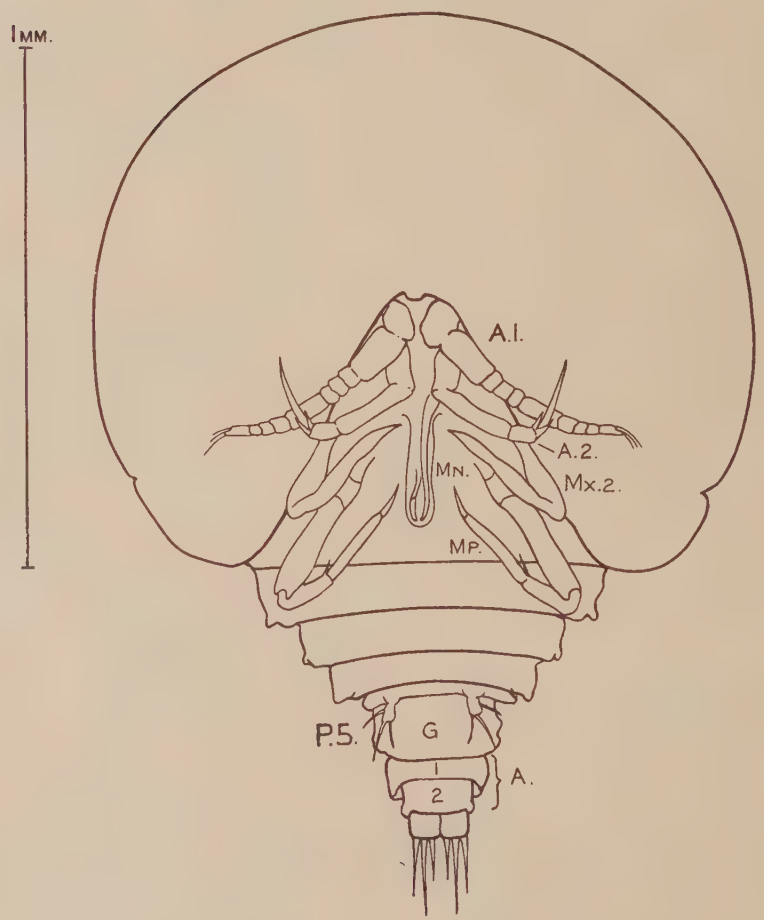

Fig. 5. *Mimacheres collyra* n. sp. ♀. Ventral aspect.

Body short, fifth segment very narrow, genital segment of part of fifth and all sixth segment, wider than long.

Abdomen of two segments, the first wider than the second with posterior round lobes.

Abdominal appendages very short each capped with three short setae.

Antennules ten-articled, the basal article acting as a fulcrum on which the remainder turns, the second and sixth articles elongated.

Antennae four-articled, the basal article small, second article long, curved and bearing a prominent large seta, terminal article small capped with one very long curved spine and two smaller ones.

Mandibles, two-articled, curved, toothless.

First maxillae not discernible.

Second maxillae two-articled, reflexed, clawed.

Maxillipedes five-articled, reflexed, the middle article with a spine, the final article a claw.

The first four pairs of Pereiopods all biramous with three-articled rami.

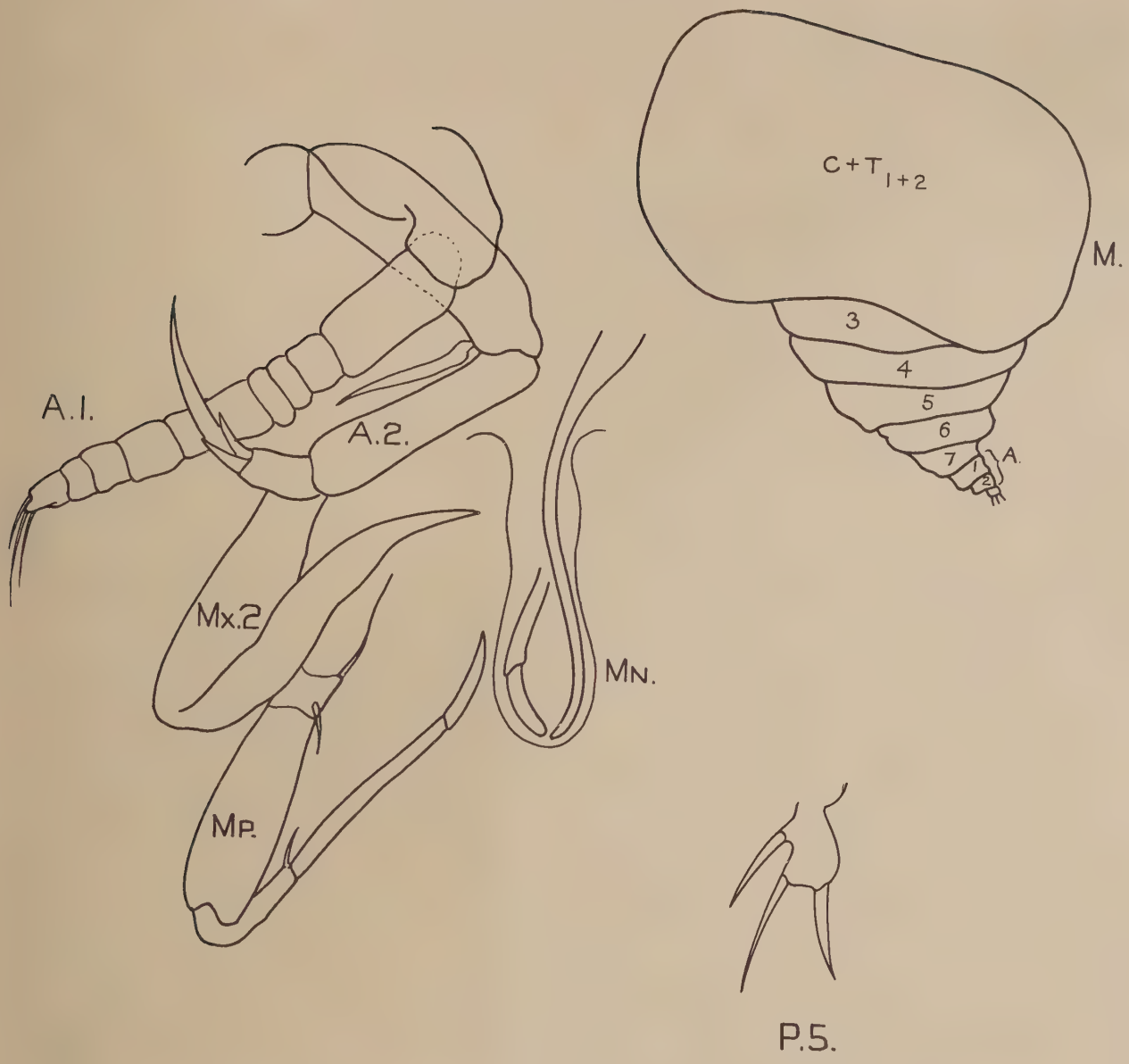

Fig. 6. *Mimacheres collyra* n. sp. ♀. Right lateral aspect and appendages.

Fifth pair of Pereiopods uniramous, an undivided flat plate with three long setae irregularly placed.

Family Lichomolgidae

Lichomolgus Thorell

1. *Lichomolgus brevicaudis* n. sp.

Commensal in *Pinna* sp.
Material: 6 ♀♀ (Fig. 7).
Diagnosis: This species has the abdominal appendages much shorter than in any species

hitherto described, hence the specific name, and capped by two long and two short setae. Abdomen of three segments.

Genital segment wider than long.

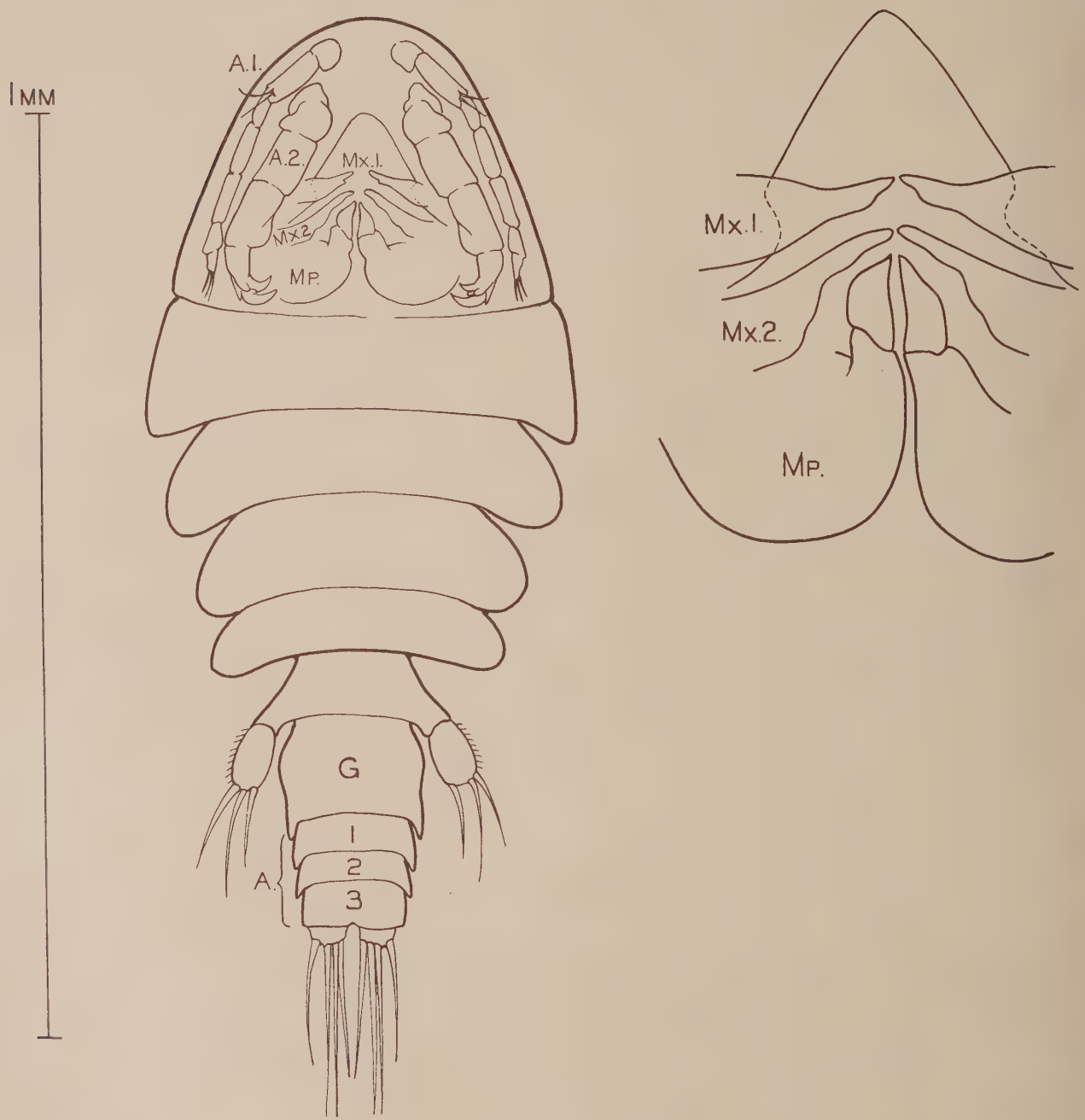

Fig. 7. *Lichomolgus brevicaudis* n. sp. ♀. Ventral aspect and appendages.

Antennules seven-articled.

Antennae four-articled tipped with two stout small claws.

Maxillae small narrow and pointed.

Maxillipedes stout, two-articled with enormous bases.

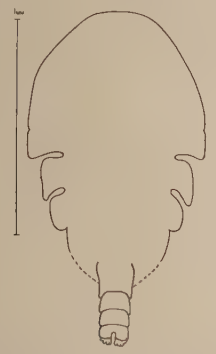

Fig. 8. Genus indeterminable. Ventral outline.

Fifth pair of Pereiopods broad flat plates, with three long terminal setae and several lateral ones.

Genus indeterminable.

Commensal in *Pinna* sp.

Material: 1 ♀ (Fig. 8).

The animal is black and opaque and only the outline can be made out.

Family Ergasilidae

Bomolochus Nordmann

1. *Bomolochus efficatus* n. sp.

No data.

Material: one young female (Fig. 9).

Diagnosis: Carapace with a rounded projection in front.

Free thorax not as wide as carapace.

Genital segment longer than wide.

Abdomen of two segments, its appendages each with one lateral and three terminal setae.

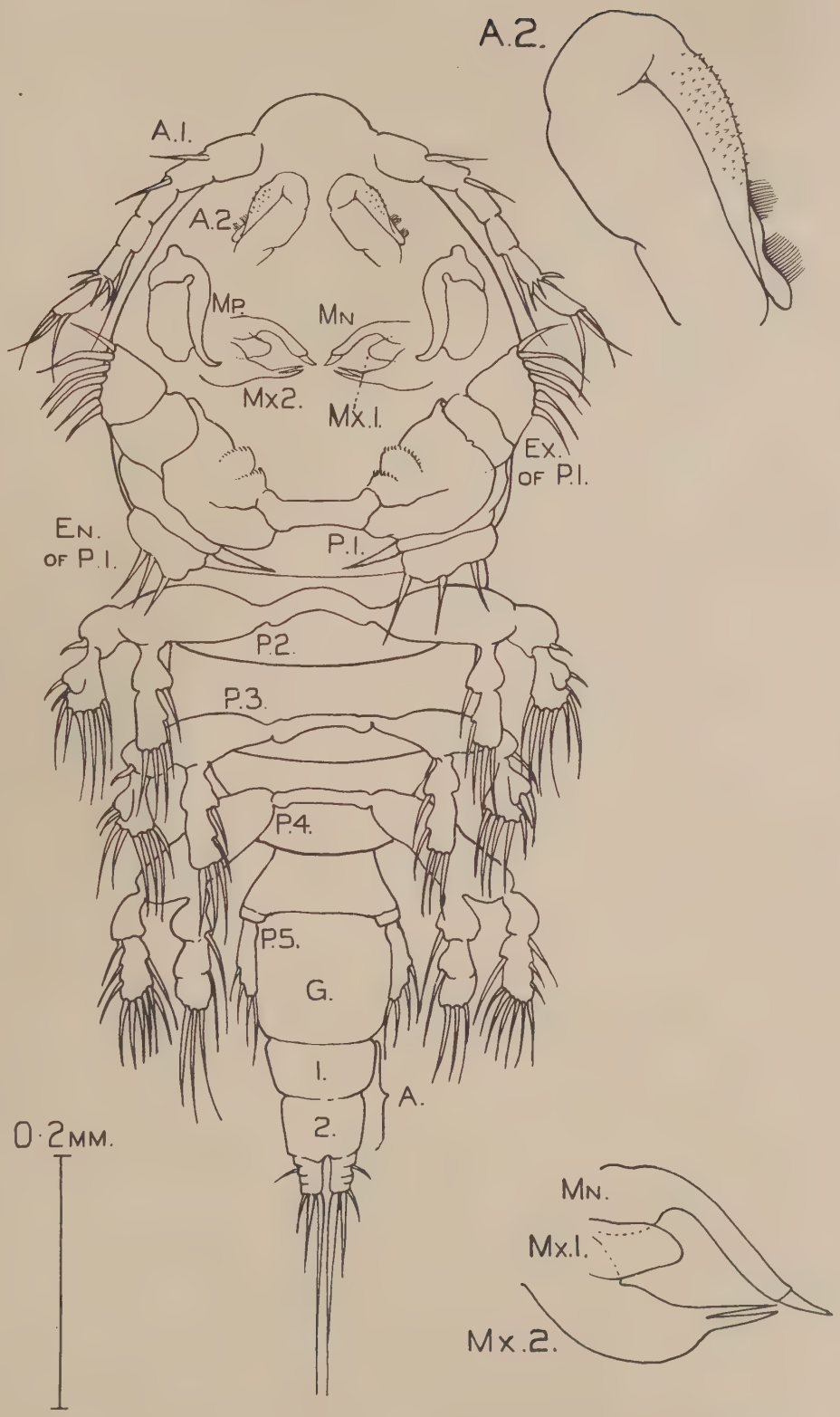

Fig. 9. *Bomolochus efficatus* n. sp. ♀. Ventral aspect and appendages.

Antennules six-articled with a few large setae.

Mandibles long, curved, two-articled.

First maxillae, small non-setose plates.

Second maxillae biramose with an enlarged base.

Maxillipedes placed longitudinally with a more powerful claw than in most species turned medianly at the apex, without setae, neither the claw nor its base serrated. They exactly resemble those of *Pseudoeucanthus* Brian (1906).

Pereiopods as in other species, the fifth pair 2-articled.

Family Chondracanthidae

Sub-Family Chondracanthinae

Humphreysia n. g.

Genus named in honour of Miss Edith C. Humphreys whose illustrations to this and all my works have been so valuable.

1. *Humphreysia floreata* n. sp.

Host: *Neobythites malayanus* M. Weber.

Location: Isthmus.

Locality: Stat. 312. Saleh Bay, Sumbawa. 274 M.

Material: 1 ♀ (Figs. 10 and 11).

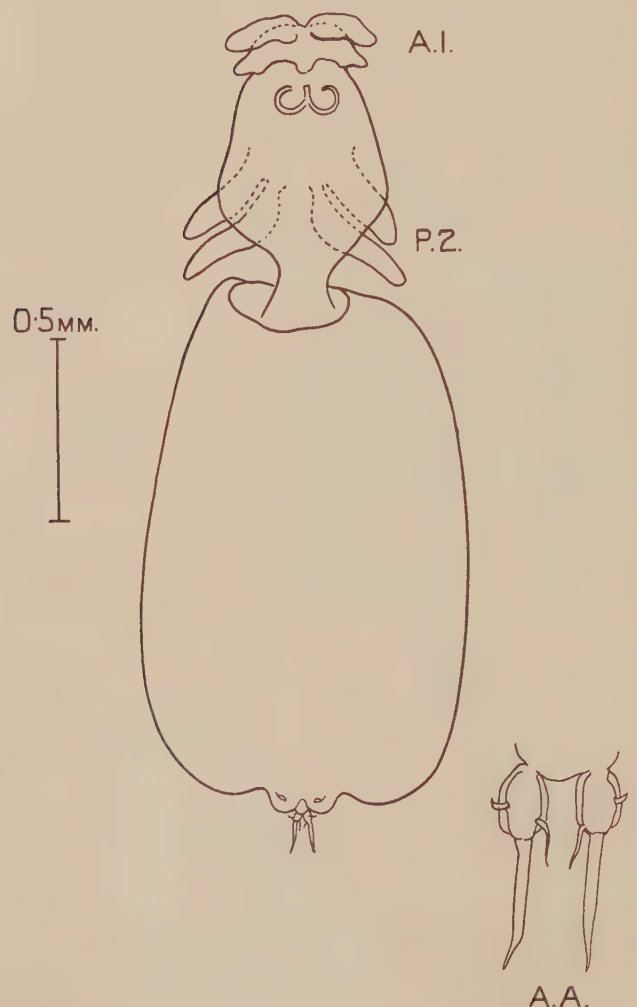

Fig. 10. *Humphreysia floreata* n. sp. ♀. Dorsal aspect.

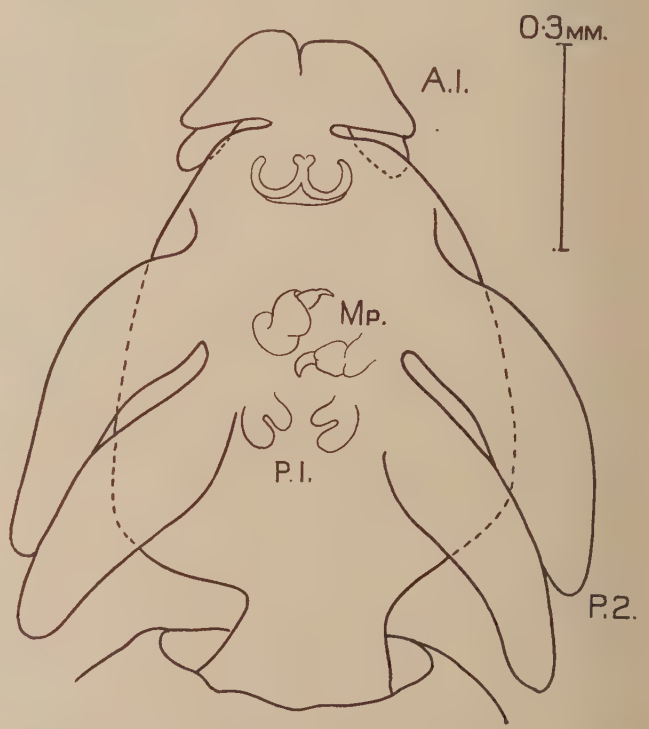

Fig. 11. *Humphreysia floreata* n. sp. ♀. Ventral aspect, enlarged view of anterior end.

Diagnosis: Female.

Head: consisting of cephalon and two thoracic segments, elongate, spatulate. No cephalic horns nor barbs.

Neck: short, expanding at the base, smooth and inserted into the trunk in such a way that the anterior end of the latter forms a prepuce round it.

Trunk: entirely thoracic, ellipsoidal, slightly broader at the posterior end. No dorsal, ventral nor posterior processes. Two small posterior projections bearing the apertures for eggstrings.

Abdomen: small, unsegmented with abdominal appendages each with a larger terminal seta, and two smaller lateral ones.

Antennules: (*A.I.*) large, soft, bifid, not articulated. (The remainder of the peribuccal appendages torn off.)

Maxillipedes: (*Mp.*): 3-articled, the middle article stout, and the distal terminating in a claw.

Pereiopods: two pairs, non-setigerous, soft, biramose, the first pair (*P.1*) small, and the second pair (*P.2*), which has apparently migrated in front of the first pair, enormous.

Male: unknown.

Remarks: This animal cannot be placed in the genus *Acanthochondria* Oakley, or any other known Chondracanthid genus as at least two thoracic segments are incorporated in the cephalon. There is a short thoracic neck foreshadowing the condition in *Scheherazade* below. No other female of this family attains so great a development of the abdominal appendages which are absent in the common genera. The disparity between the pereiopods is very great.

Immanthe n. g.

1. *Immanthe campanulata* n. sp.

Host: *Paracentropogon aeglefinus* M. Weber.

Locality: Stat. 306. Lobetobi Strait. 247 M.

Material: 1 ♀ + ♂ (Figs. 12 and 13.)

Diagnosis: Female

Head: blunt, subquadrangular. One pair of cephalic barbs.

Neck: Short with lateral expansions.

Trunk: campanulate with rounded postero-lateral projections. No dorsal, lateral nor posterior processes. Two median posterior genital lobes between which lies the male.

Abdomen: not distinctly marked off from the trunk.

Antennules: soft, uniramous, not articulated. (The remainder of the appendages torn off.)

Pereiopods: absent, unless they are represented fused by the plate *P.* on the ventral side of the neck.

This animal cannot be located in any known genus of this family on account of the aberrant character of the male.

Male

Body: very broad anteriorly, with the trunk and abdomen curled forward ventrally like the abdomen of a crab, so that the animal can be mounted on its back. Trunk distinctly four-

segmented; abdomen small terminating in two small abdominal appendages as is usual in the males of this family.

Antennules (*A.1*): 4-articled, reflexed, terminating in two long and two short setae. The proximal article much the longest, bent on itself, with a seta at the bend, and proximally a recurved hook.

Antennae (*A.2*): 2-articled, the proximal stout, the distal ending in a stout, much curved claw.

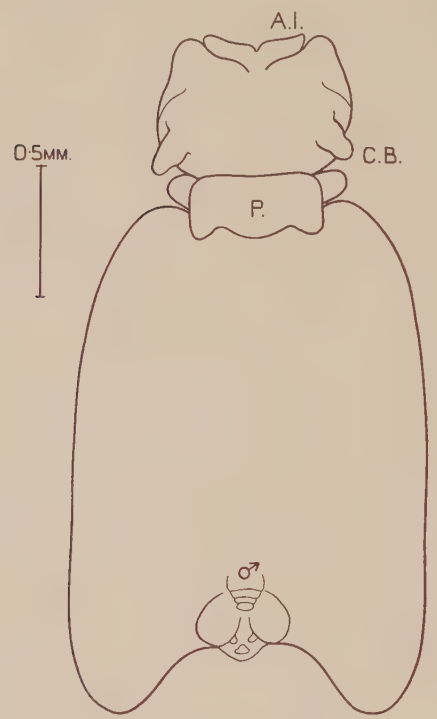

Fig. 12.
Immanthe campanulata n. sp. ♀. Ventral aspect.

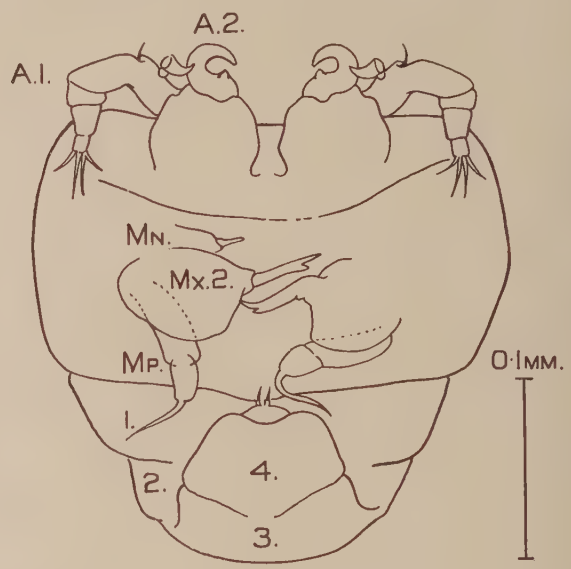

Fig. 13.
Immanthe campanulata n. sp. ♂. Ventral aspect.

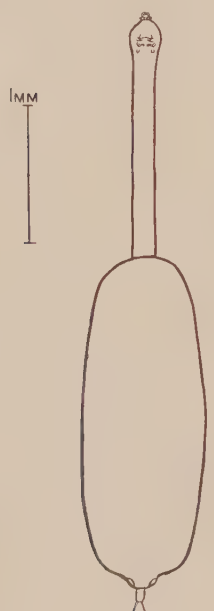

Fig. 14. *Scheherazade sheherazade* n. sp. ♀. Ventral aspect.

Mandibles (*Mn*): 2-articled, the distal pointed and toothed.

Second maxillae (*Mx.2*): 2-articled, the basal very stout, the distal bifid, crossing its fellow in the mid-line.

Maxillipedes (*Mp.*): 2-articled, the proximal elongated and the distal terminating in an extremely long seta.

Scheherazade n. g.

1. *Scheherazade scheherazade* n. sp.

Host: *Symphurus [Aphoristia] elongatus* Günther.
Location: Skin.

Locality: Stat. 314. Flores Sea. 694 M.

Material: 1 rather damaged ♀. (Figs 14, 15 and 16).
Diagnosis: Female

Head: consisting of cephalon and one thoracic segment, spherical (0.3 mm³), separated from the neck by a slight constriction. No cephalic horns nor barbs.

Neck: entirely thoracic, very long and narrow (2.0 mm × 0.2 mm); sharply separated from the trunk, but not enlarged at the base, and of the same diameter throughout.

Trunk: entirely thoracic, ellipsoidal, slightly flattened dorsiventrally (3.0 × 1.2 × 0.8 mm. largest dimensions). No dorsal, ventral nor posterior processes. Median posterior projection bearing apertures for eggstrings.

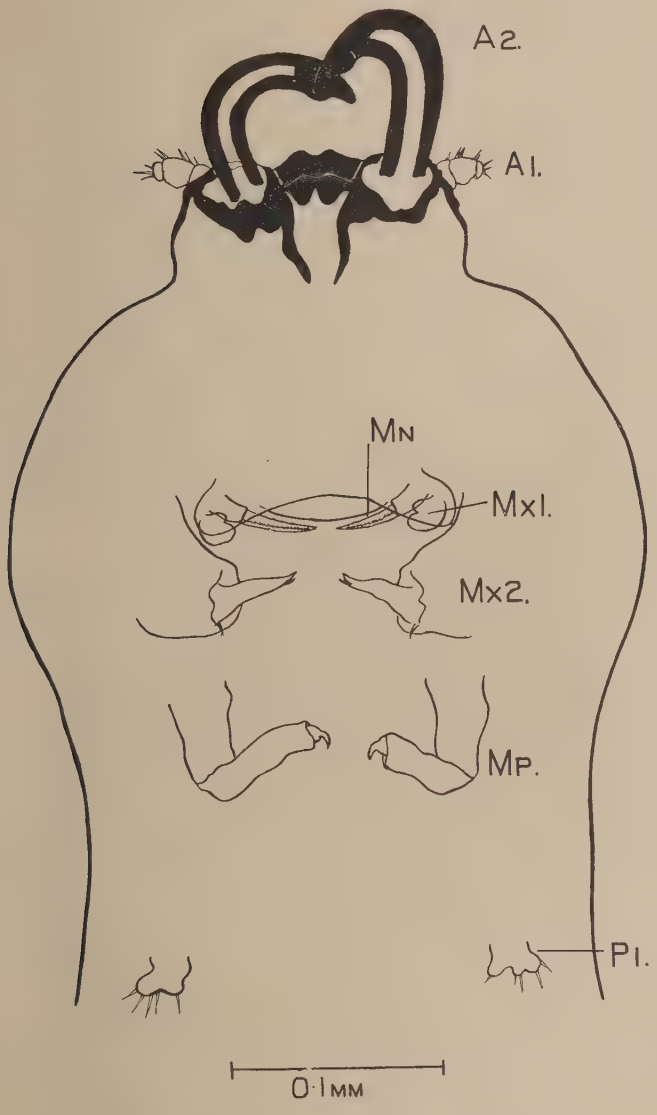

Fig. 15. *Scheherazade scheherazade* n. sp. ♀. Ventral aspect, enlarged view of anterior end.

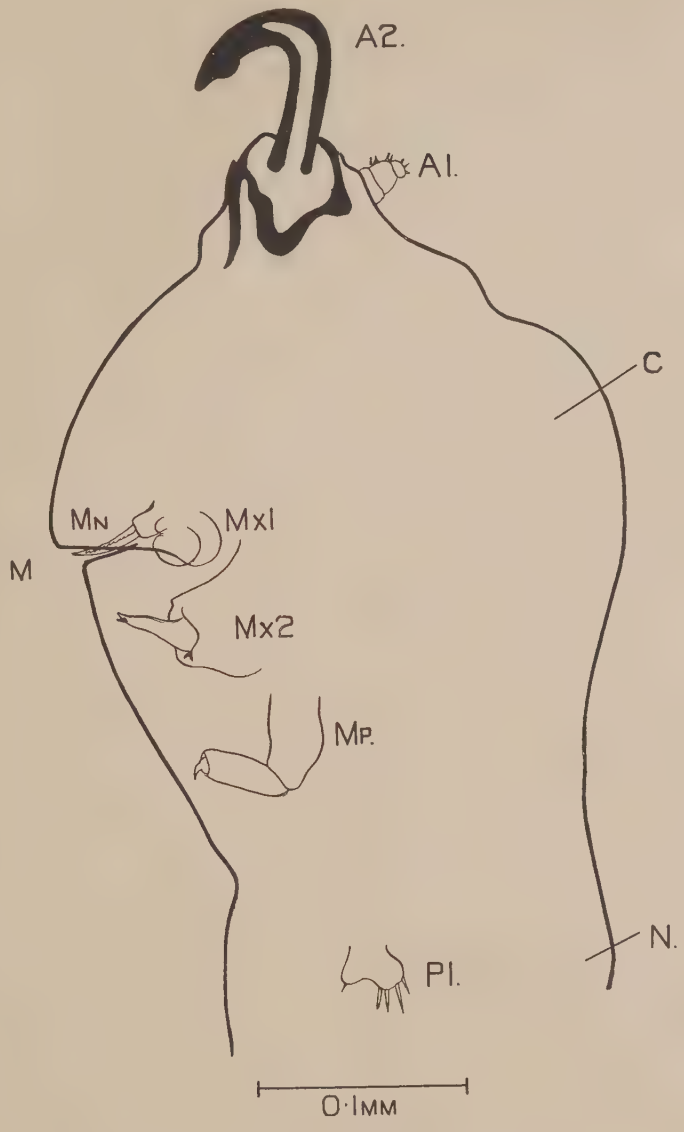

Fig. 16. *Scheherazade scheherazade* n. sp. ♀, Left lateral aspect, enlarged view of anterior end.

Abdomen: unsegmented, with small abdominal appendages resembling those of the male Chondracanthidae.

Appendages: 6 pairs, all unusually small with the exception of the antennae.

Antennules (*A1.*): 3-articled, all provided with setae, the second the longest, the distal very small.

Antennae (*A2.*): very strong uncini, with knob on concave surface, borne on the usual thickly-chitinised cephalic shield.

Mandibles (*Mn.*): 2-articled, falciform, one row only of about fifteen teeth visible.

First maxilla (*Mx.1.*): a bilobed plate without setae.

Second maxilla (*Mx.2.*): 2-articled, the basal unusually massive, the terminal a curved spine, with at least one lateral tooth. Basal spine small.

Maxillipede (*Mp.*) (First thoracic appendage): 3-articled, second article longest, terminal a sharply-curved hook. No spine pads.

Pereiopod (*P.1.*) (Second thoracic appendage): a small apparently unjointed plate, bilobed, with a few setae, immediately posterior to the constriction between the head and the neck.

Male: unknown.

Remarks: Although its general form appears at first sight very dissimilar from that of the more typical Chondracanthidae, detailed examination of the appendages shows that it must be retained in this family. The second antennae, mandibles, 2nd maxillae and maxillipedes are especially characteristic. This species is however the first Chondracanthid to be described in which the head is separated from the trunk by a very long thoracic neck; there is no information supplied with the specimen to make it certain that the head and neck were buried in the host, though the extreme slenderness of the neck suggests it very strongly. The great majority of Chondracanthids are attached merely by the 2nd antennae; a few (the Lernentominae) by a "head and neck" composed of two cephalic segments buried in the host — but even here the mouth remains outside. But, although this species shows an unusual degree of specialisation in burying its whole head with the mouth deep in the tissues of its host, it still retains the primitive features suggested by the 3-articled setose antennules and the total lack of processes. These render a new genus necessary for its reception.

Generic characters ♀. Head small, no horns, no barbs, separated from trunk by a long thoracic neck probably buried in the host. Trunk ellipsoidal, without processes, with definite median posterior projection. Abdomen small, unsegmented with one pair of appendages. Appendages in general very small and similar to those typical of the Chondracanthidae with the following exceptions: Antennules 3-articled, not inflated, setose. Pereiopods one pair, flattened, bilobed, setose plates.

APPENDIX

The collection examined by me contained the following free-swimming forms:

Open Ocean Plankton

Family Calanidae

Bathycalanus Sars

1. *Bathycalanus richardi* Sars 1905.

Locality: Stat. 185. Manipa Strait, from 1536 M. to surface, vertical net.

Material: 2 sp.

Abyssal forms

Family Artotrogidae

Artotrogus Boeck

1. *Artotrogus abyssicolus* Scott 1894.

No data.
Material: 2 sp.

Family Corycaeidae

Saphirella Scott

1. *Saphirella abyssicola* Scott 1894.

No data.
Material: 1 sp.

Sub-Order CALIGIFORMES

Family Caligidae

Sub-Family Caliginae

Caligus Müller

In the following species of *Caligus* only those characters that are diagnostic are mentioned though all are figured.

1. *Caligus dubius* Scott 1894.

No data.
Material: (*a*) 2 ♀♀ (*b*) 4 ♂♂. (Figs. 17 and 18).
Diagnosis: Female
The figures of Scott are so small and uninformative that for the identification I am relying on the shape of the abdomen and the elongated maxillary hook, which however, bears two setae.
Furca with broad, blunt ends, parallel, not divergent.
Genital segment short, a little longer than wide.
Abdomen elongated, one segment, vase-like and gently tapering.
The spine always associated with the exopodite of the third pereiopod is represented by a large blunt spike on an enlarged base.
The fifth pereiopod bears one seta and the sixth two.

Male

The furca and the spike of the third pereiopod resemble those of the female, while the large maxillary hook is more curved.

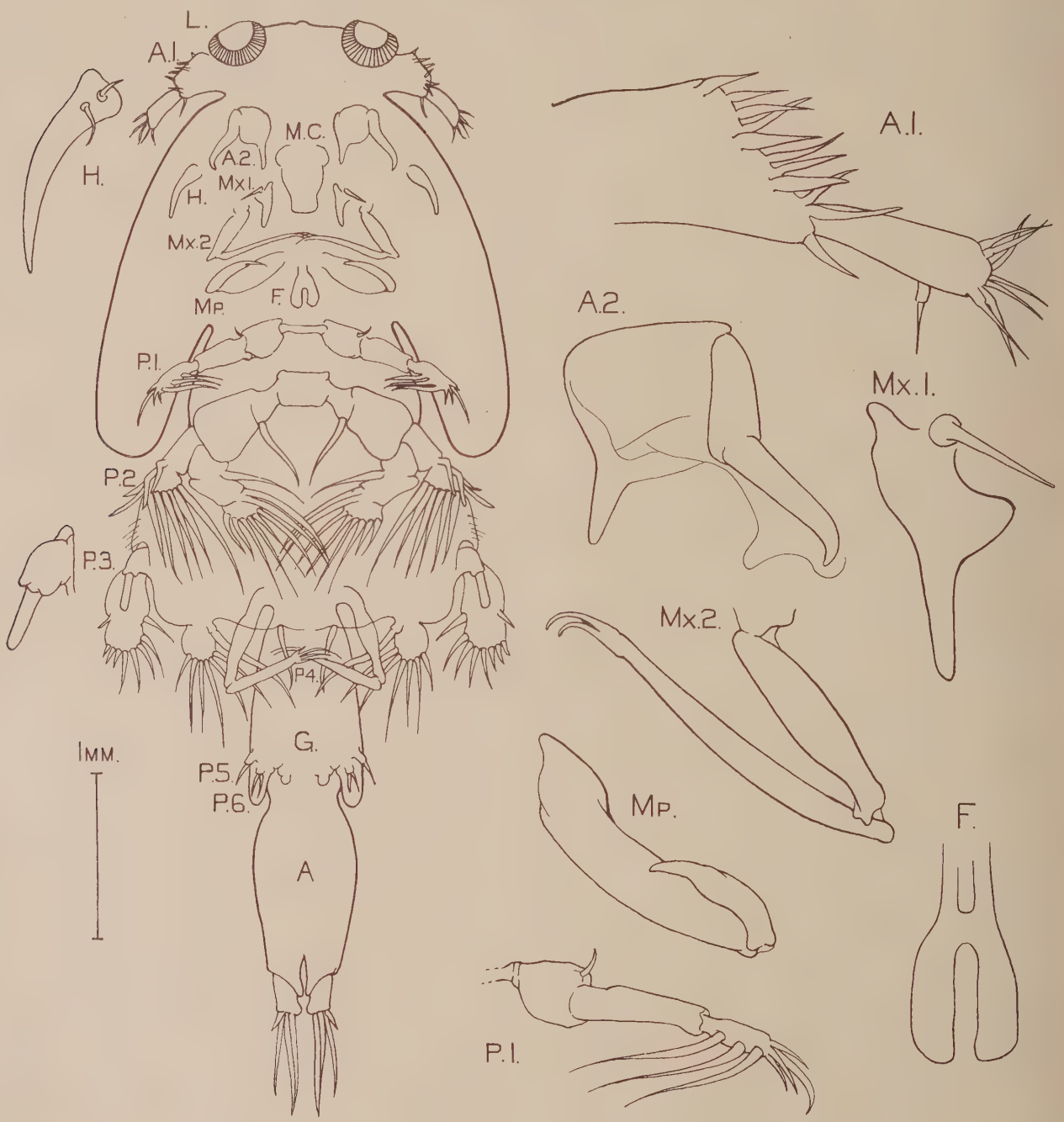

Fig. 17. *Caligus dubius* Scott. ♀. Ventral aspect and appendages.

Genital segment much longer than wide.

Abdomen elongated, widest posteriorly, the anterior portion constricted but not making a separate segment.

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The claw on the antenna is separately articulated as in all males.

The fifth pereiopod is biramous, the exopodite bears one seta and the endopodite two. The sixth bears two setae.

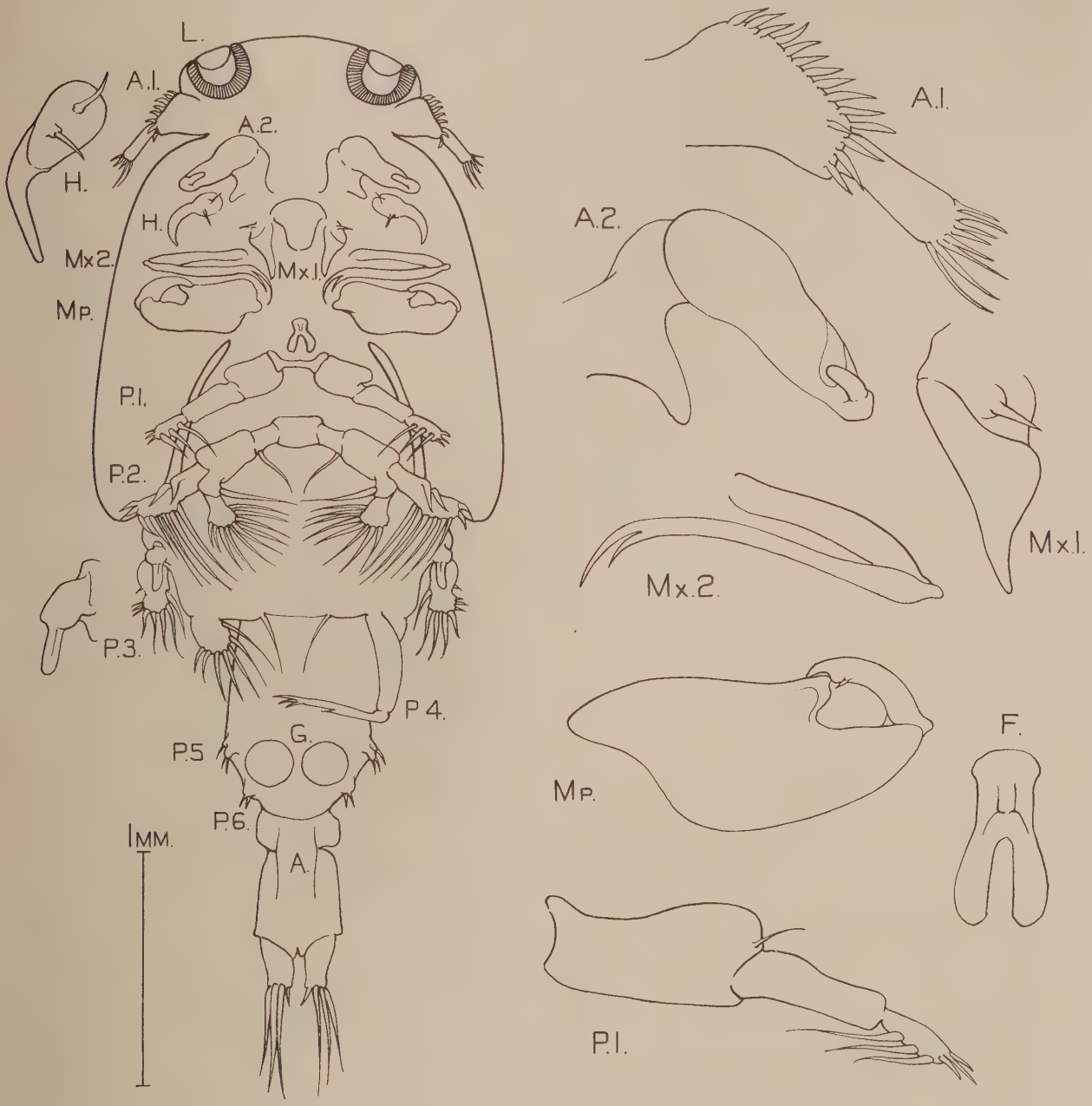

Fig. 18. *Caligus dubius* Scott. ♂. Ventral aspect and appendages.

2. *Caligus eventilis* n. sp.

Host: A black Pomacentrid fish.

Locality: Stat. 144. Anchorage Salomakië Island. 45 M.

Material: 1 ♀ (Fig. 19).

Diagnosis: Carapace much wider than long.
Lunules wide and shallow.
Furca short with a wide arch.
Genital segment, enormously broad with a narrow portion anteriorly.

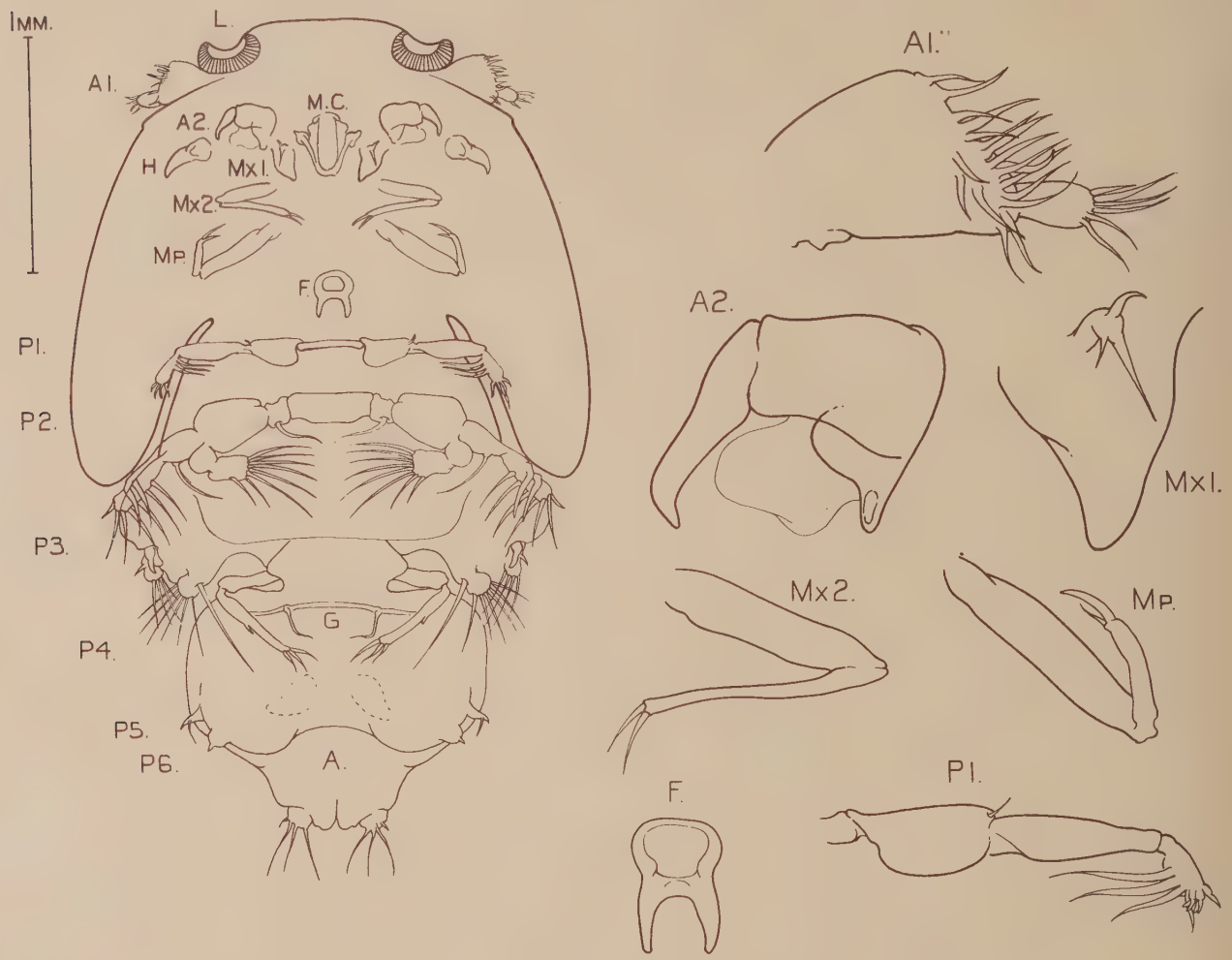

Fig. 19. *Caligus eventilis* n. sp. ♀. Ventral aspect and appendages.

Abdomen one segment, broader than long, with short rami.
The exopodite of the first maxilla has four setae instead of the usual one.
The claw of the maxillipede is feeble with a seta at the base of the claw, while both proximal and distal articles are slender and narrow.
The distal article of the antennule is small.
The fifth pereiopod bears two setae while the sixth is mammillated with a spine.

3. *Caligus mirabilis* n. sp.

Host: *Balistes flavomarginatus* Rüpp.
Location: Tail.
Locality: Stat. 106. Kapul Island, Sulu Archipelago.

Material: 1 ♀ (Fig. 20).

Diagnosis: Carapace narrowed anteriorly.

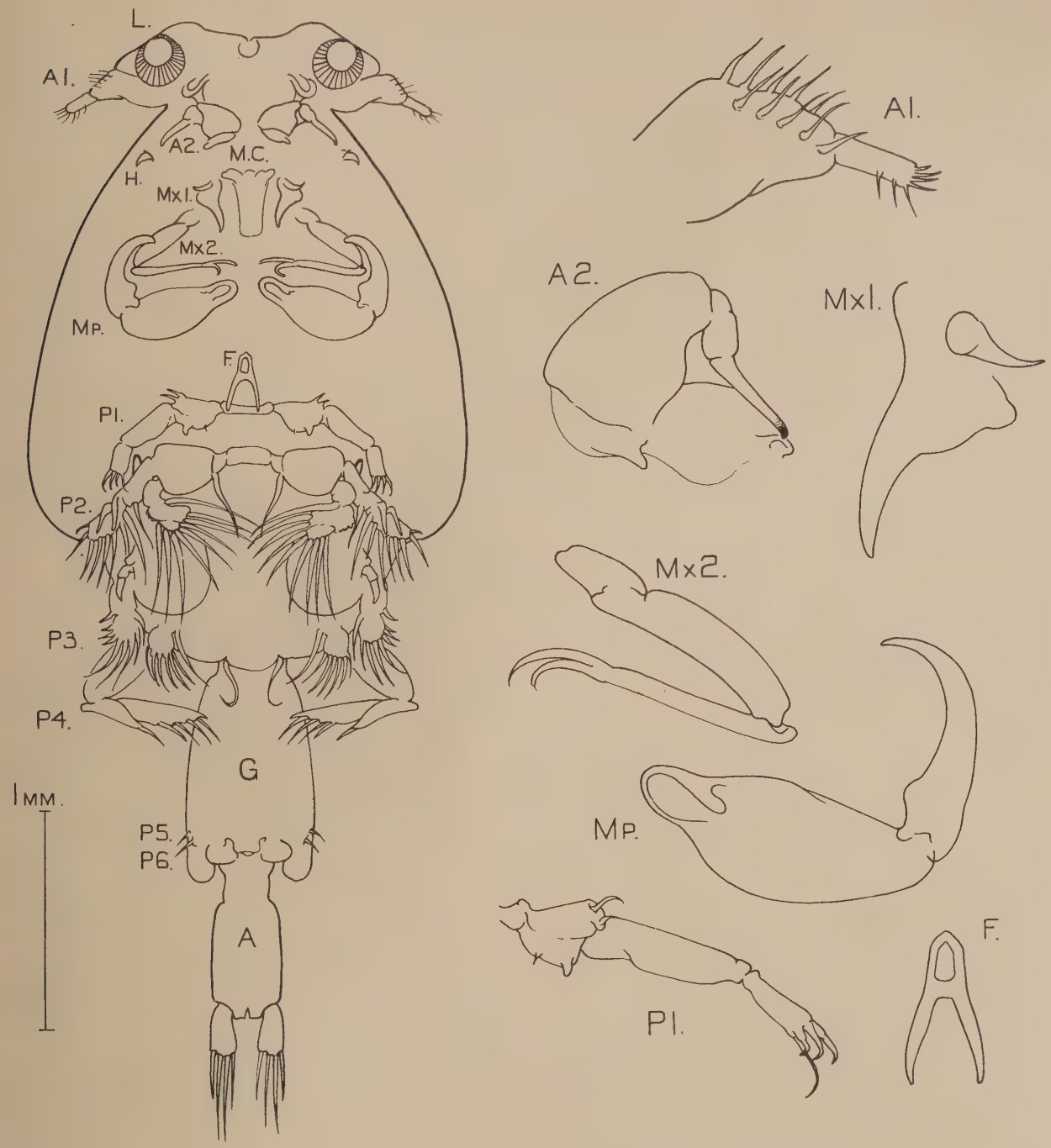

Fig. 20. *Caligus mirabilis* n. sp. ♀. Ventral aspect and appendages.

Lunules and antennules boldly standing out anteriorly on a transverse frontal platform.

Genital segment much longer than wide with rounded postero-lateral projections.

Abdomen one segment, elongated, with parallel sides, the anterior portion much constricted.

Maxillary hook very small.

The distal article of the antennule with small setae instead of large ones.

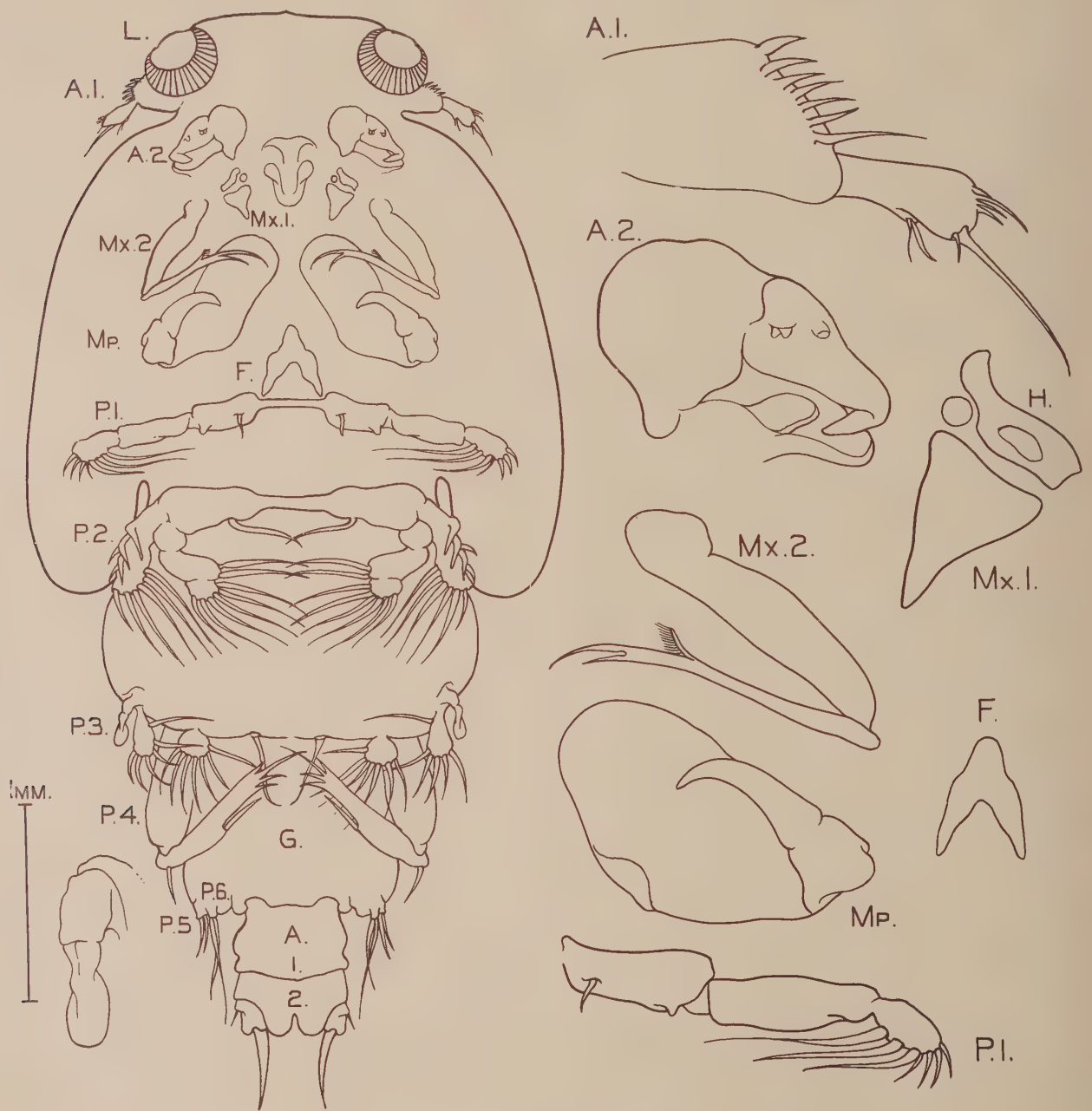

Fig. 21. *Caligus mordax* n. sp. ♀. Ventral aspect and appendages.

The claw of the antenna not powerful and curved, but slender and straight with a highly-chitinised apex.

The lateral sinuses of the carapace are not deeply incised.

Furca long, slender with divergent prongs.

Maxillipede with an enormous distal claw, as long as the terminal article.

The first pereiopod, while having larger terminal setae, has no long marginal setae on the distal article.

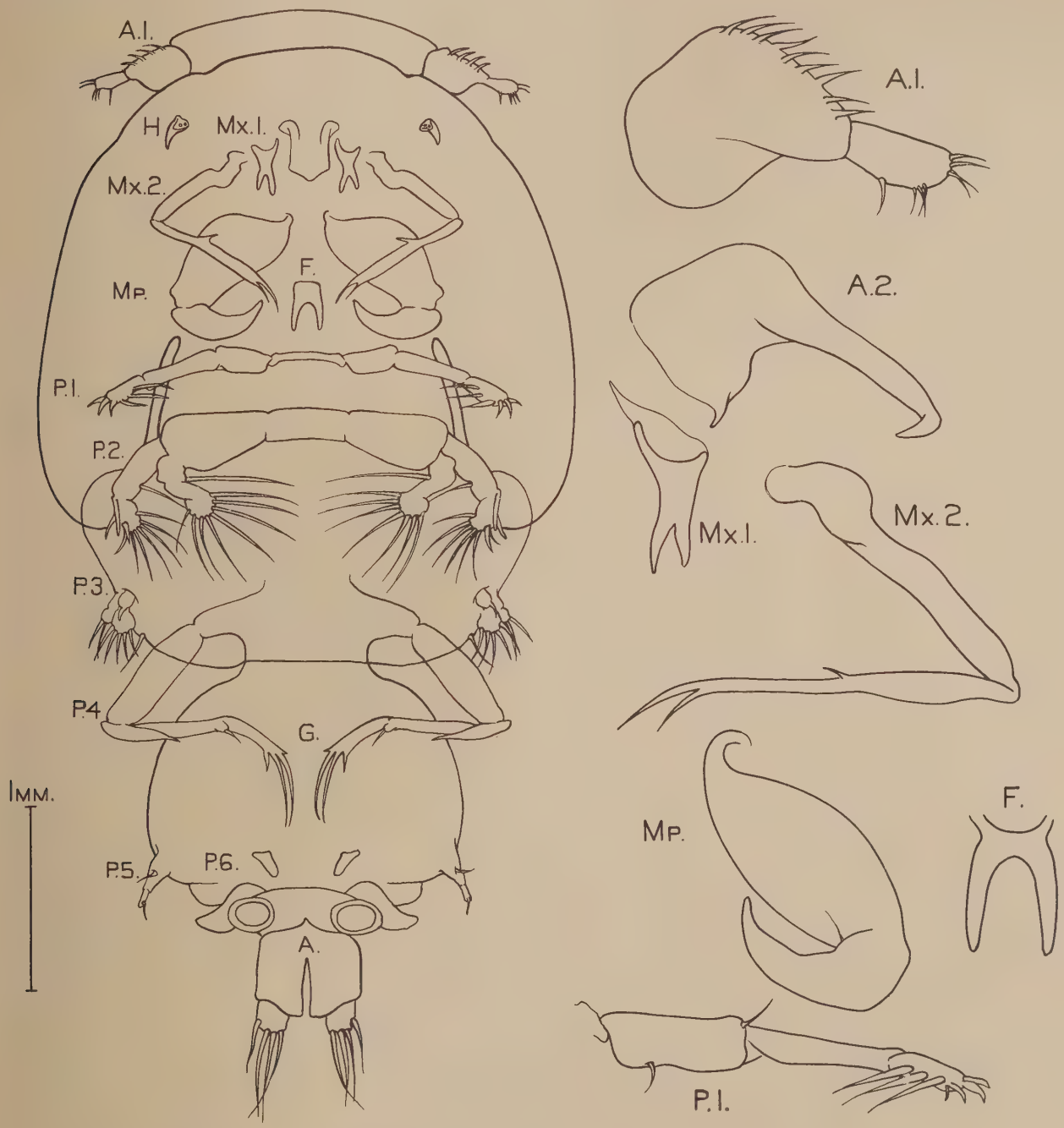

Fig. 22. *Lepeoptheirus perpes* n. sp. ♀. Ventral aspect and appendages.

The fifth and sixth pereiopods each bear one seta.

The fourth pereiopods are larger and stouter and more heavily setose.

The usual supporting bars of chitin end between the antennae and the lunules with a large trumpet-mouth curl.

4. *Caligus mordax* n. sp.

No data.

Material: 1 ♀ (Fig. 21).

Diagnosis: Carapace nearly as broad as long, lateral sinuses not deep. Lunules large. Apron broad.

Genital segment as wide as long.

Abdomen two segments with ornate margins, rami short and recessed each bearing in stead of the usual four setae one long terminal seta, and one small lateral one.

Furca short, stout with very divergent prongs.

The apex of the antennule has one enormous seta, in addition to others.

The antenna has a powerful recurved claw.

The first maxilla has no seta. The maxillary hook (*H*) is represented by an irregularly-shaped plate.

The second maxilla has a brush-like spine near its bifid apex.

The maxillipede has a powerful reflexed claw. The spine of the third pereiopod is replaced by a flattened spoon-like spike even more prominent than in *C. dubius*.

The fifth and sixth pereiopods are side by side on the margins of the broad genital segment, and each bears two setae much longer than is usual.

Lepeophtheirus Nordmann

1. *Lepeophtheirus perpes* n. sp.

Host: *Anyperodon leucogrammicus* C. V.

Locality: Stat. 172. Gisser Island. 18 M.

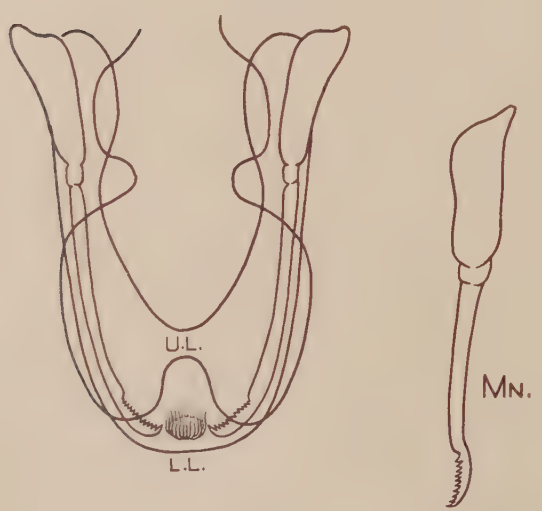

Fig. 23. *Lepeoptheirus perpes* n. sp. ♀. Mouth cone.

Material: 2 ♀♀ (Figs. 22 & 23).

Diagnosis: Carapace wider than long. First maxilla bifid. Maxillary hook small. Apron very large.

Genital segment much wider than long, laterally rounded.

Abdomen one segment with a deep median posterior incision.

Distal article of the second maxilla with a spine.

The exopodite of the third pereiopod very small.

Fifth pereiopod two-articled with one seta on each article.

Sixth pereiopods reduced to non-setose stumps medianly situated.

Chalimus stages

1. Host: *Pomacentrus fasciatus* C. V.

Locality: Stat. 93. Sanguisiapo Island, Sulu Archipelago. Reef.

2. Host: *Pomacentrus trilineatus* C. V.

Locality: Stat. 248. Tiur Island, Reef.

3. Host: *Abudefduf [Glyphidodon] brownriggi* Benn.

Locality: Stat. 234. Núsa Laut Island. Reef.

Sub-family Pandarinae

Pandarus Leach

1. *Pandarus cranchii* Leach 1819.

(*a*) No data: Fish parasites E.
Material: Numerous ♀♀.
(*b*) No data: Fish parasites C.
Material: 5 ♂♂.

2. *Pandarus smithii* Rathbun 1886.

(*a*) No data: Fish parasites F.
Material: 3 ♀♀.
(*b*) No data: Fish parasites D.
Material: 3 ♂♂.

Nesippus Heller

1. *Nesippus curticaudis* (Dana) 1852.

No data: Fish parasites A.
Material: 2 ♂♂.

Perissopus Steenstrup & Lütken

1. *Perissopus communis* Rathbun 1887.

Host: *Carcharias melanopterus* Q. G.
Location: Tail.

Locality: Stat. 71. Makassar.

Material: 2 ♀♀.

Sub-family Euryphorinae

Alebion Krøyer

1. *Alebion carchariae* Krøyer 1863.

No data: Fish parasites B.
Material: 2 specimens.

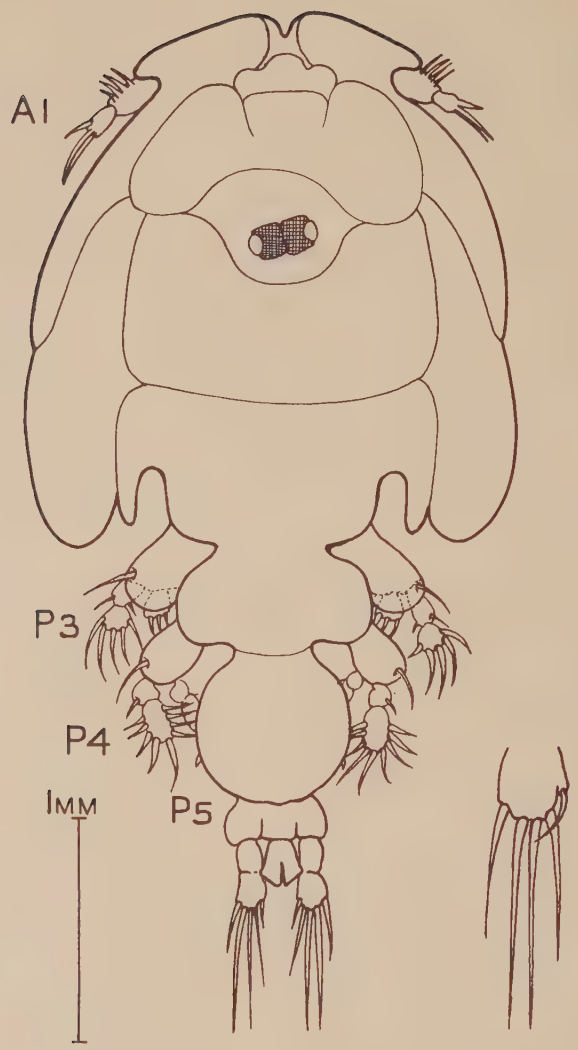

Fig. 24. *Dysgamus murrayi* (Brady). ♂. Dorsal aspect.

Dysgamus Steenstrup and Lütken

1. *Dysgamus murrayi* (Brady) 1883.

Synonym: *Dysgamus ariommus* Wilson 1907.

No data.

Material: (*a*) 2 ♂♂ (Figs. 24 and 25). (*b*) 5 ♂♂.

The specimens differ from *D. ariommus* Wilson in that the antennules are differently situated and the proximal article is larger. The dorsal plates of the fourth thoracic segment completely cover the bases as well as part of the rami of the third pair of pereiopods. The central part of the head area (Wilson) is divided into two parts, the anterior being, trilobate.

The fifth pair of pereiopods bears two large and two small terminal setae. There are two furcae one behind the other, the posterior the smaller.

In group (*a*) one of the two specimens has each of the fourth pair of pereiopods uniramose.

One of the abdominal appendages of each of the specimens has five plumose setae instead of the usual four.

Judging from their apparently biramous nature what I have called the fifth pair of pereiopods is possibly the fifth and sixth fused together.

Family Dichelesthiidae

Peniculisa Wilson

1. *Peniculisa furcata* (Krøyer) 1863.

Host: *Ostracion punctatus* Bl. Schn.

Locality: Stat. 234. Nusa Laut, Reef.

Material: 2 ♀♀, (one headless) (Fig. 26).

This animal has not been figured by a recent author.

Piratasta n. g.

1. *Piratasta virgatula* n. sp.

Commensal in *Laternula [Anatina]* sp.

Locality: Stat. 50. West coast Flores.

Material: 1 ♀. (Fig. 27).

Diagnosis: Body narrow, elongated, of much the same width throughout, divided into cephalothorax, trunk and abdomen. Seven pairs of dorsal laminae, five pairs close together,

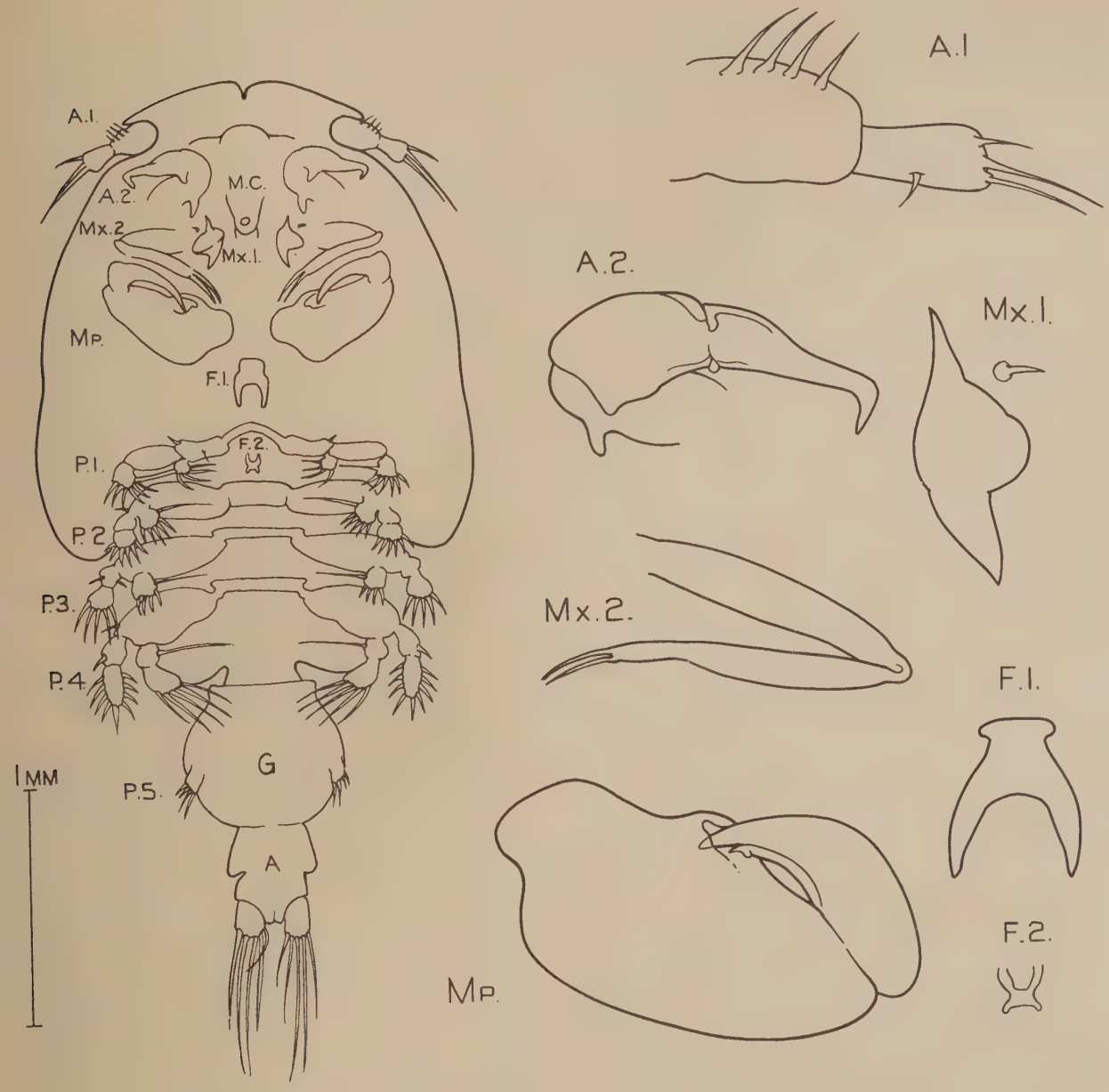

Fig. 25. *Dysgamus murrayi* (Brady). ♂. Ventral aspect and appendages.

one pair further removed posteriorly and one pair at the end of the trunk. Abdomen of one segment, with small posterior paired appendages apparently non-setose.

Antennules short, five-articled, the proximal article the largest with papillae bearing spines.

Antennae large prehensile claws.

No other anterior appendages observable.

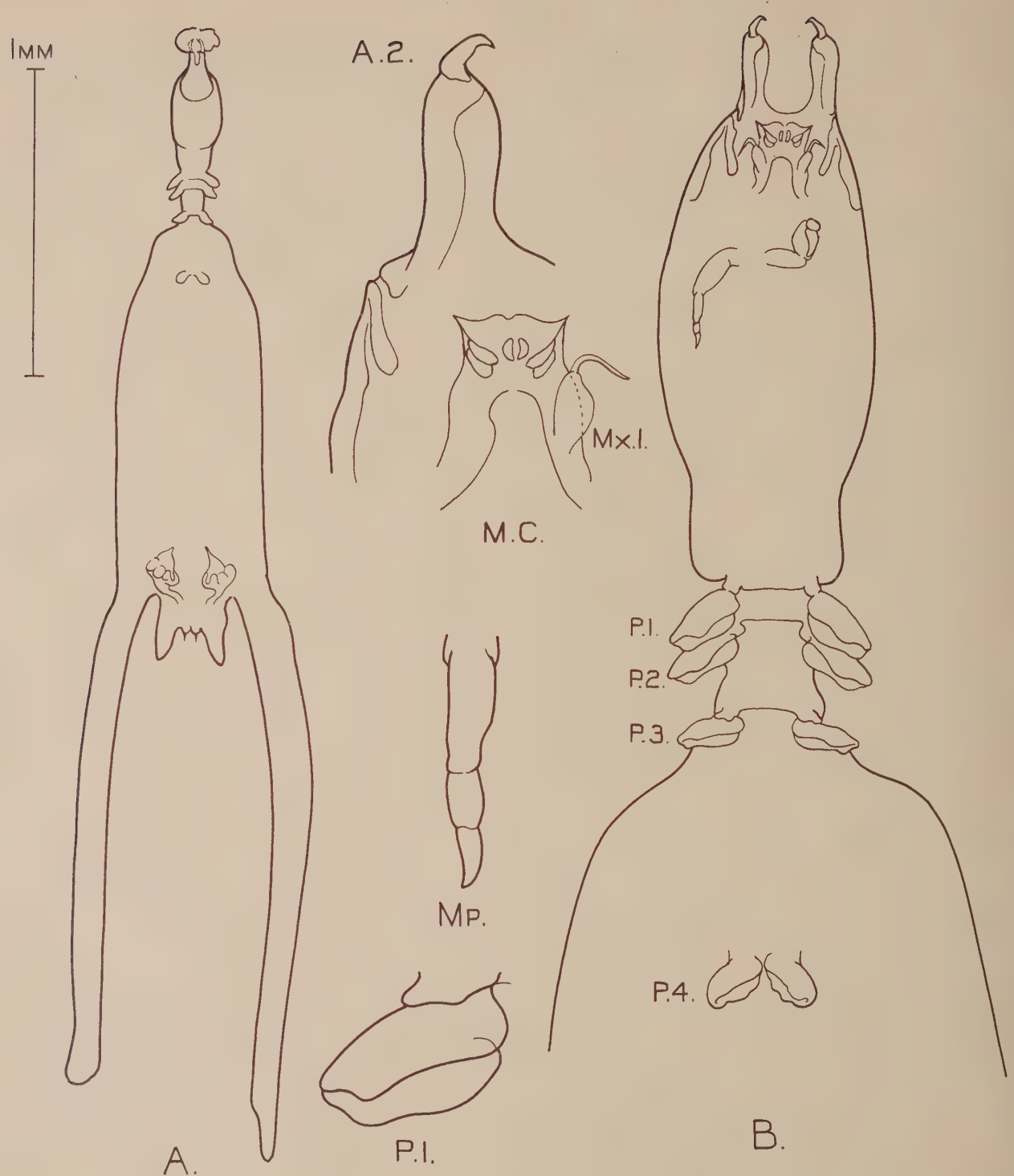

Fig. 26. *Peniculisa furcata* (Krøyer). ♀. *A.* Ventral aspect. *B.* Ventral aspect, enlarged view of anterior end.

Four pairs of pereiopods reduced to minute one-articled stumps, rounded and perhaps have borne setae.

No traces of segmentation in cephalothorax and trunk.

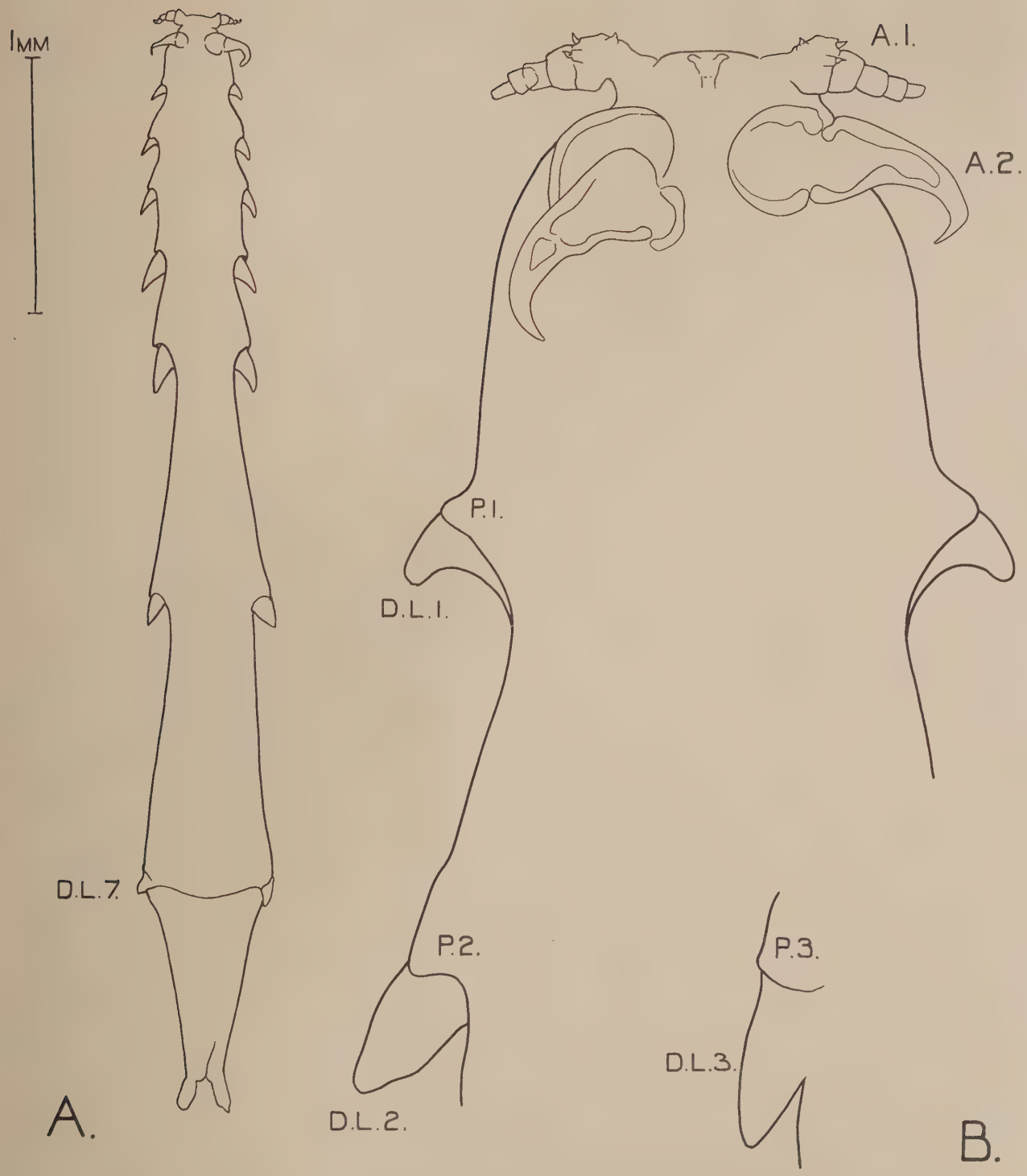

Fig. 27. *Piratasta virgatula* n. sp. ♀. *A.* Ventral aspect. *B.* Ventral aspect, enlarged view of anterior end.

New family Ventriculinidae

Antennules with more than three articles (usually 4). Antennae not clawed nor chelate. Mouth cone prominent with lateral lips and ringed with setae. The ventral surface of the carapace, and the bases of all appendages are profusely denticled. The pereiopods may be reduced to chitinous stumps with palps. First maxillae probably wanting.

Abdomen elongated and segmented.

Parasitic on Sipunculoidea.

Heliogabalus n. g.

1. *Heliogabalus pulvauratus* n. sp.

Host: *Aspidosiphon levis* Sluiter.

Location: On skin.

Locality: Stat. 142. Anchorage Laiwui, Obi major.

Material: 1 ♀ (Figs. 28 and 29).

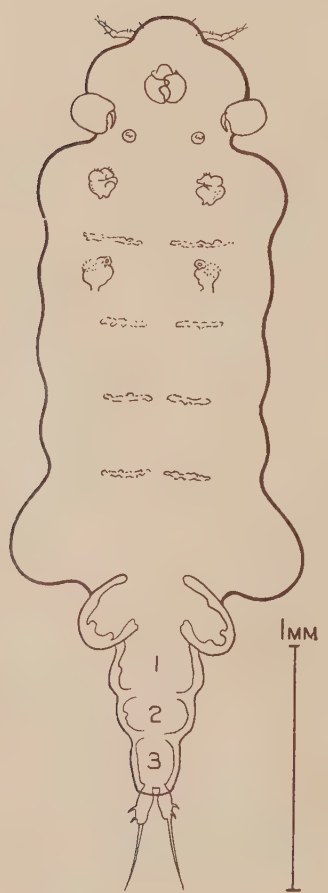

Fig. 28.
Heliogabalus pulvauratus n. sp.
♀. Ventral aspect.

Diagnosis: Cephalon trilobate, the ventral surface of the lateral lobes covered with denticles. The first two thoracic segments bearing respectively the maxillipedes and the first pair of pereiopods fused with the Cephalon. Trunk elongate composed of six segments, the fifth and sixth forming the genital segment. The fifth segment with projecting rounded corners, the sixth narrower than the rest of the trunk with large elliptical, spoon-shaped lateral expansions bearing the vulvae. Abdomen of three segments decreasing in width posteriorly. Abdominal appendages each terminating in a single large seta, and with two small, lateral, curved setae. A small stump bearing a long, fine seta in front of each antennule. Two large spines in front of the mouth cone. The basal articles of all the appendages are covered with denticles. A pad of denticles to the inner side of each maxillipede, and over the region of the alimentary canal in each segment ventrally is a broad belt of denticles (not figured).

Antennules: four-articled, bearing at each joint several stout setae with rounded ends. Antennae not clawed, three-articled, the proximal article forming a stout denticled pad upon which the other two are flexed outwards at an angle, the second article denticled, with a lateral spine, the third narrow with a few denticles and a subterminal hook, ending in one or two long setae. Mouth cone prominent with two lateral lips and surrounded by a ring of setae, basally strongly supported by chitin bars with a pair of lateral setae. First maxillae with a stout base, a posterior and a terminal hook. The mandibles and second maxillae cannot be made out. Maxillipedes consisting of a large, stout, projecting base with probably a terminal claw torn

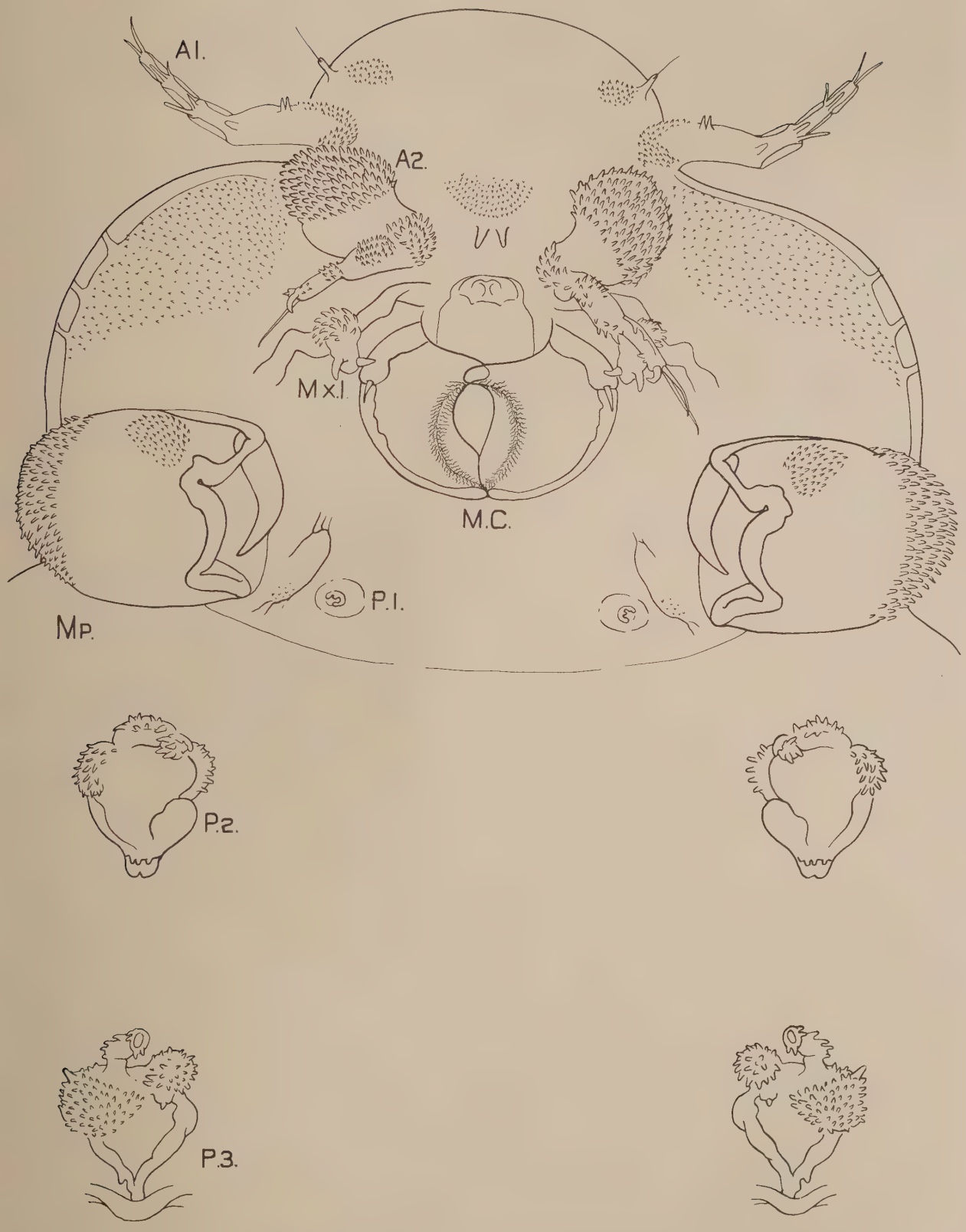

Fig. 29. *Heliogabalus palvauratus* n. sp. ♀. Ventral aspect, enlarged view of anterior end.

off which fits into a stout chitinous socket. Three pairs of pereiopods, the first minute, reduced to stout chitinous stumps; each may be considered as having an exopodite and endopodite bearing denticles and ending in a hook. The exopodite of the third appears to terminate in a circular aperture.

This animal resembles *Ventriculina crosslandi* Basset-Smith 1903, which also occurs on the skin on *Aspidosiphon* sp, at Zanzibar. I have therefore associated *Ventriculina* and *Heliogabalus* in one family, the Ventriculinidae, which differs from the Dichelesthiidae principally in having reduced pereiopods, non-chelate long antennae, and, in the case of *Heliogabalus*, a three-segmented abdomen. Basset-Smith does not mention whether *Ventriculina* is covered with denticles, and his specimen appears to have lost the terminal seta of the abdominal appendages.

The chief difficulty in the way of their inclusion in one family is the peculiarity of the pereiopods in *Heliogabalus*.

Ventriculina differs from *Heliogabalus* in having an abdomen of two segments, while the pereiopods are of the usual type but reduced and uniramous and setigerous.

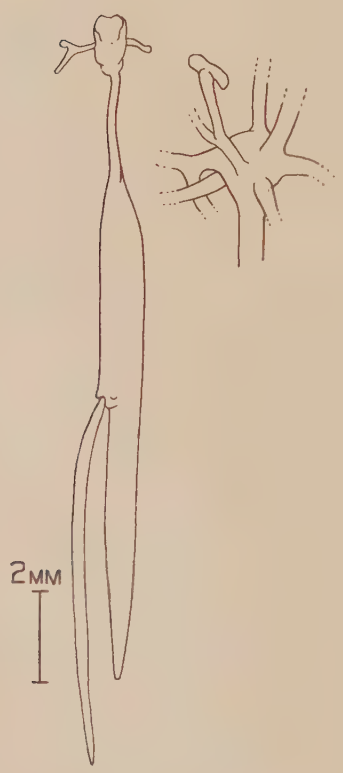

Fig. 30. *Lernaeenicus gnathonicus* n. sp. ♀.

Family Lernaeidae

Lernaea? Linnaeus

1. *Lernaea*? sp.

Host: *Diaphus suborbitalis* M. Weber.

Locality: Stat. 262. Arafura Sea. 560 M.

Material: A few fragments in which the shape of the body and what can be seen of the horns is suggestive of *Lernaea* which is however a fresh-water genus.

Lernaeenicus Le Sueur.

1. *Lernaeenicus gnathonicus* n. sp.

Host: *Pomacanthus imperator* (Bl.)

Locality: Makassar.

Material: 7 ♀♀ in fragments, only one complete (Fig. 30).

Diagnosis: Head profusely covered with short bifid horns as in *L. polyceraus* Wilson 1917 from which species this can be distinguished as follows: Abdomen one and a fifth times the length of the trunk, neck half the length of the trunk.

2. *Lernaeenicus gnavus* n. sp.

Host: *Polyipnus spinosus* Günther.

Locality: Stat. 12. Madura Sea. 287 M.

Material: 1 ♀ with head, and some fragments. (Fig. 31).

Diagnosis: Head damaged. Antennules, antennae, and periopods plainly visible. Neck slightly longer than trunk and constricted slightly posteriorly. Abdomen minute. No horns nor tubercles on head as far as can be seen.

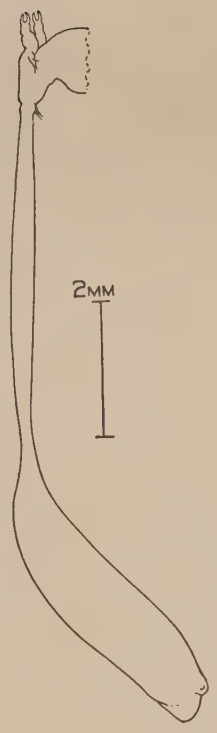

Fig. 31. *Lernaeenicus gnavus* n. sp. ♀.

3. *Lernaeenicus* sp.

Host: *Belone hians* C. V.

Location: Ventral fin.

Locality: Anchorage off Samarang. Dec. 1912.

Material: One ♀ fragment. No head. No neck. Abdomen minute.

Peniculus Nordmann

A large number of members of this genus is present in the collection but not one of them shows the claw on the antenna.

1. *Peniculus elegans* n. sp.

Host: *Chromis lepidurus* C. V.

Locality: Stat. 144. Anchorage Salomakië Island.

Material: 9 ♀♀. (Fig. 32).

Diagnosis: Specimens all very small. Head subquadrangular. Mouth cone prominent. No chitin bars. Thoracic legs large in proportion to neck. Total length of animal 1.8 mm. Trunk three times as long as wide. Anal laminae present.

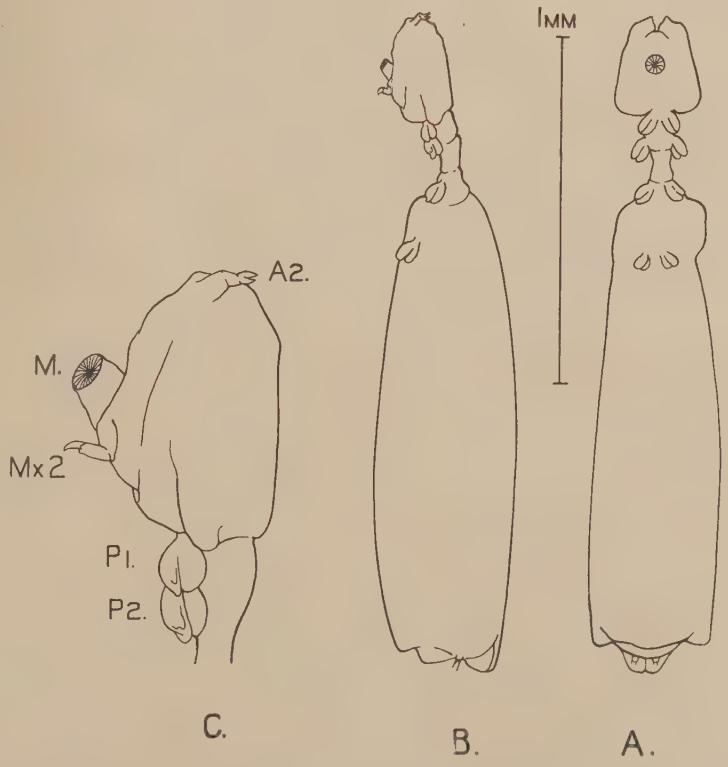

Fig. 32. *Peniculus elegans* n. sp. ♀. A. Ventral aspect. B. Left lateral aspect. C. Left lateral aspect, enlarged view of anterior end.

2. *Peniculus communis* n. sp.

(*a*) Host: *Atherina forskåli* Rüpp.

Location: Upper rays of the caudal fins.

Locality: Ambon.

Collector: Dr. L. F. de Beaufort, Dec. 7, 1909.

Material: 1 ♀. (Fig. 33).

(*b*) Host: *Atherina pinguis* Lac.

Location: Tail.

Locality: Stat. 231. Ambon.

Material: 2 ♀♀ with marked chitinisation of the head.

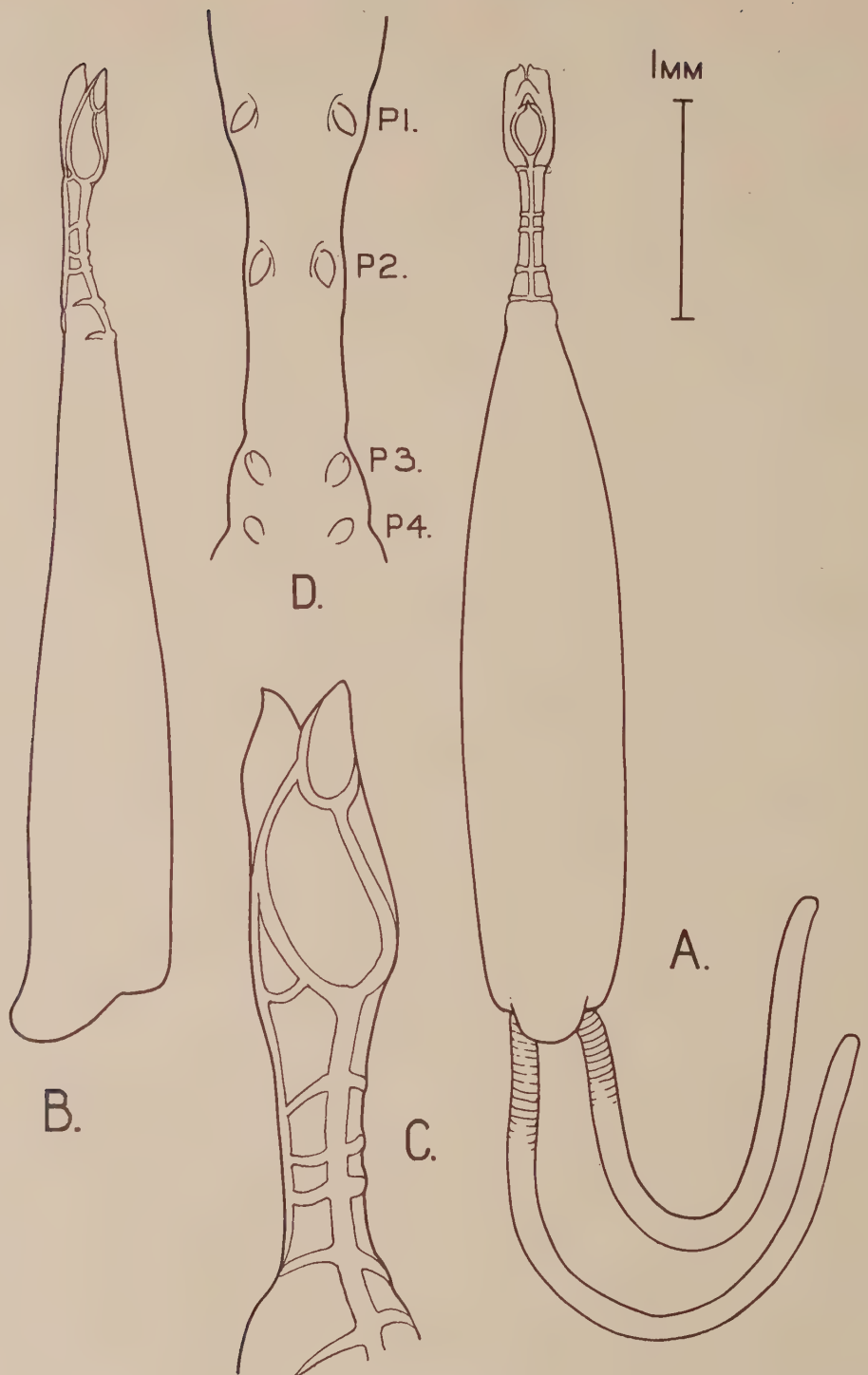

Fig. 33. *Peniculus communis* n. sp. ♀. *A.* Ventral aspect. *B.* Right lateral aspect. *C.* Right lateral aspect, enlarged view of anterior end. *D.* Neck and pereiopods.

(*c*) Host: *Exocoetus opisthopus* Blkr.

Location: Pectoral and ventral fins.

Locality: Stat. 213. Saleyer.

Material: 6 ♀♀.

SIBOGA-EXPEDITIE

XIV

COPEPODA

Siboga-Expeditie

UITKOMSTEN

OP

ZOOLOGISCH, BOTANISCH, OCEANOGRAPHISCH EN GEOLOGISCH GEBIED

VERZAMELD IN

NEDERLANDSCH OOST-INDIË 1899—1900

AAN BOORD H. M. SIBOGA ONDER COMMANDO VAN

Luitenant ter zee 1e kl. G. F. TYDEMAN

UITGEGEVEN DOOR

Dr. MAX WEBER
Em. Prof. in Amsterdam, Leider der Expeditie

(met medewerking van de Maatschappij ter bevordering van het Natuurkundig Onderzoek der Nederlandsche Koloniën)

LEIDEN
E. J. BRILL
1934

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XIV

COPEPODA

ANDREW SCOTT. **The COPEPODA of the Siboga Expedition.**
Part I. **Free-Swimming, Littoral and Semi-Parasitic Copepoda.**
With 69 plates, 323 p. [livr. 44, Sept. 1909]

W. HAROLD LEIGH-SHARPE. **The COPEPODA of the Siboga Expedition.**
Part II. **Commensal and Parasitic Copepoda.** With 39 text-figures.
43 p. [livr. 123, Déc. 1934]

LEIDEN
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1909—1934

(*d*) Host: *Clupea moluccensis* Blkr.

Locality: Stat. 142. Laiwui, Obi major.

Material: 2 ♀♀ damaged.

(*e*) Host: *Spratteloides delicatulus*. Benn.

Locality: Stat. 213. Saleyer.

Material: 3 ♀♀, base of neck inflated.

(*f*) Host: *Caesio diagramma* Blkr.

Locality: Stat. 213. Saleyer.

Material: 4 ♀♀.

Fig. 34. *Thanatodectes semaphorus* n. sp. ♀.

Diagnosis: Specimens large and a few small. Head oval. Internal chitin bars prominent both longitudinal and transverse, especially in (*b*). No sign of mouth cone, nor of peribuccal appendages. Thoracic legs very small in proportion to neck. Total length of the large specimens 4.7 mm. Trunk four times as long as wide.

Thanatodectes n. g.

1. *Thanatodectes semaphorus* n. sp.

Host: *Apogon novemfasciatus* C. V.

Locality: Stat. 131. Beo, Karakelang Island.

Material: 1 ♀. (Fig. 34).

Diagnosis: Body resembling that of *Lernaeenicus*. Abdomen small, one eleventh the length of trunk. Neck half the length of trunk, narrow but expanded anteriorly where it bears three pairs of lateral processes, the two posterior pairs hard, transparent, chitinous and as long as the narrow region of the neck, the anterior pair white opaque, soft, broader and pointing forwards. There is no other Copepod bearing lateral processes in this manner. I have, therefore ventured to erect for it a new genus. The head is wanting; the family cannot be located with certainty. There is moreover a further pair of soft processes loose in the fluid in the tube similar to the anterior pair. It is therefore impossible to say how many paired processes there should be on the neck.

Fig. 35. *Cardiodectes rubosus* n. sp. ♀. Ventral aspect.

Sarcotretes Jungersen

1. *Sarcotretes eristaliformis* (Brian) 1912.

Host: *Hymenocephalus striatissimus* Jordan & Gilb.

Locality: Stat. 12. Madura Sea. 289 M.

Material: 6 ♀♀.

2. *Sarcotretes scopeli* Jungersen 1911.

Host: *Myctophum evermanni* Gilb.

Locality: Stat. 230. Banda Sea. Vertical net from 200 metres to surface.

Material: 1 ♀.

Cardiodectes Wilson

1. *Cardiodectes rubosus* n. sp.

Host: *Apogon* sp.

Locality: Stat. 144. Salomakië Anchorage; reef.

Material: 1 ♀. (Fig. 35).

Diagnosis: Bifid horns confined to cephalothorax.

Neck very short, much dilated. Trunk cylindrical, of same diameter throughout. Two small posterior processes.

Haemobaphes Steenstrup & Lütken

1. *Haemobaphes dilectus* n. sp.

Host: *Gobius variabilis* Steindachner.

Locality: Stat. 181. Ambon, Reef.

Material: 3 ♀♀ all without head. (Fig. 36).

Diagnosis: Closely resembling *H. enodis* Wilson 1917

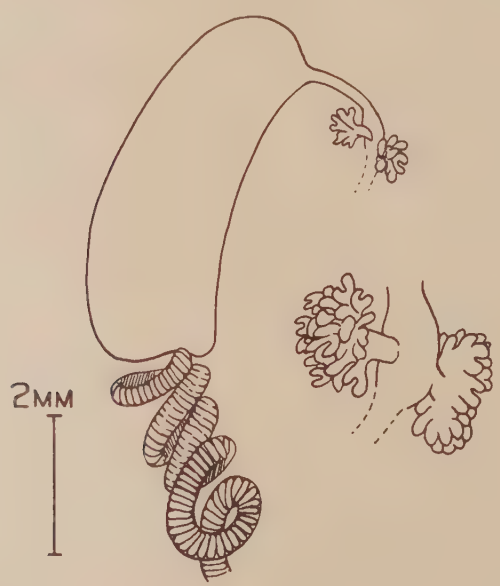

Fig. 36. *Haemobaphes dilectus* n. sp. ♀.

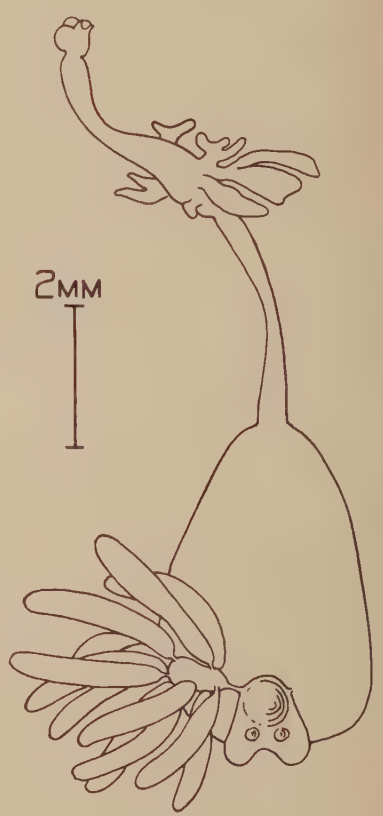

Fig. 37. *Rebelula cardusa* n. sp. ♀.

in having no lumps or protuberances on the trunk, but differing from it in the following characters:

Neck short in proportion, lateral horns probably represented by a pair of closely packed

branched processes, sharply marked off from trunk to which it is at right angles, and not gradually merging into it.

Trunk broader in proportion. Abdomen reduced to a minute projection.

Family Sphyriidae

Rebelula Poche

1. *Rebelula cardusa* n. sp.

Host: *Hymenocephalus striatissimus* Jord. & Gilb.

Locality: Stat. 74. Makassar Str. 450 M.

Material: 1 ♀. (Fig. 37).

Diagnosis: Resembling *R. cornuta* Wilson 1919, of which likewise only one specimen has been taken, and of which this may prove to be a young form, being but a third the size of Wilson's specimen from which it differs in the following particulars:

Cephalothorax not transversely wrinkled. Neck in the same straight line as trunk, elongated, the horns situated some distance from the cephalothorax. The neck is constricted half way between the mouth and the horns, and again half way between the horns and the trunk, but not where the neck joins the trunk. The neck is much enlarged where the short bifid horns arise. The trunk has no dorsal nor ventral deep paired grooves and no shallow pits in the position of such grooves. Length of trunk 5.5 mm. Abdomen spherical with dorsolateral abdominal appendages, one of which is turned forward on the left in the figure and bears 12 soft processes of the usual type generally regarded as respiratory. Eggstrings lacking as in Wilson's specimen.

Family Lernaeopodidae

Brachiella Cuvier

1. *Brachiella superba* n. sp.

Host: *Malacocephalus laevis* Lowe.

Location: Pharynx near first branchial arch.

Locality: Stat. 38. Flores Sea. 521 M.

Material: One ♀ bearing a ♂. (Figs. 38 and 39).

Diagnosis: Female.

Cephalothorax elongate, cylindrical, flexed forwards. Head enlarged, length of head and neck 2.6 mm. Trunk flattened dorsiventrally, pyriform, slightly constricted laterally, widest posteriorly, wider than long, length 2 mm., width 2.4 mm. Genital process small. Posterior processes one pair, ventral to the eggstrings, elongated, distal ends narrow for some distance, nearly as long as the eggstrings, length 3 mm. longer in proportion than in any other species,

and arising more anteriorly on the trunk than is usual. Second maxillae short and completely

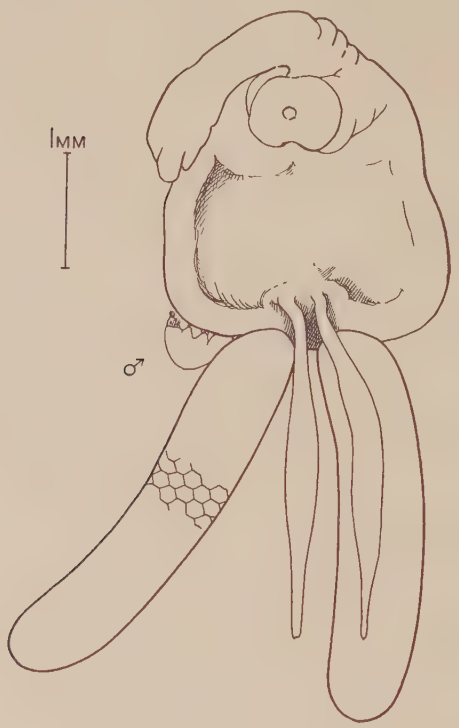

Fig. 38.
Brachiella superba n. sp. ♀. Ventral aspect.

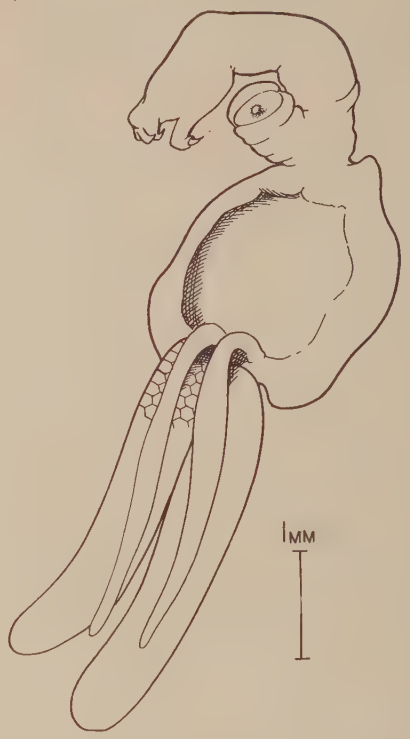

Fig. 39.
Brachiella superba n. sp. ♀. Ventro-lateral aspect.

fused. Bulla spherical and strongly chitinised. Eggstrings 3.6 mm., much longer than trunk, broad, twice the width of the posterior processes at their broadest part, not tapering.

Male

Closely resembling that of *B. thynni*.

A LIST OF FISHES IN THE COLLECTION AND THEIR CHARACTERISTIC PARASITIC COPEPODA

Fish	Parasite
Apogon novemfasciatus C. V.	*Thanatodectes semaphorus* n. sp.
Apogon sp.	*Cardiodectes rubosus* n. sp.
Anyperodon leucogrammicus C. V.	*Lepeophtheirus perpes* n. sp.
Atherina forskåli Rüpp.	*Peniculus communis* n. sp.
Atherina pinguis Lac.	*Peniculus communis* n. sp.
Balistes flavomarginatus Rüpp.	*Caligus mirabilis* n. sp.
Belone hians C. V.	*Lernaeenicus* sp.
Caesio diagramma Blkr.	*Peniculus communis* n. sp.
Carcharias melanopterus Q. G.	*Perissopus communis* (Rathbun)
Chromis lepidurus C. V.	*Peniculus elegans* n. sp.
Clupea moluccensis Blkr.	*Peniculus communis* n. sp.
Diaphus suborbitalis M. Weber	*Lernaea* ?
Exocoetus opisthopus Blkr.	*Peniculus communis* n. sp.
Gobius variabilis Steind.	*Haemobaphes dilectus* n. sp.
Hymenocephalus striatissimus Jord. & Gilb.	*Rebelula cardusa* n. sp.
Hymenocephalus striatissimus Jord. & Gilb.	*Sarcotretes eristaliformis* (Brian)
Malacocephalus laevis Lowe	*Brachiella superba* n. sp.
Myctophum evermanni Gilb.	*Sarcotretes scopeli* Jungersen
Neobythites malayanus M. Weber	*Humphreysia floreata* n. sp.
Ostracion punctatus Bl. Schn.	*Peniculisa furcata* (Krøyer)
Paracentropogon aeglefinus M. Weber	*Immanthe campanulata* n. sp.
Polyipnus spinosus Günther.	*Lernaeenicus gnavus* n. sp.
Pomacanthus imperator (Bl.)	*Lernaeenicus gnathonicus* n. sp.
Spratteloides delicatulus Benn.	*Peniculus communis* n. sp.
Symphurus [Aphoristia] elongatus Günther	*Scheherazade scheherazade* n. sp.

Many of the above are deep-sea fishes.

REFERENCES

Bassett-Smith (1903). *Proc. Zool. Soc.* Vol. I, p. 106, fig. 12.

Brady (1883). Challenger Report VIII.

Brian (1906). Copepodi Parassiti dei Pesci d'Italia. Genova.

—— (1912). Copépodes parasites ... des campagnes scientifiques de S. A. le prince Albert Ier de Monaco p. 20.

Canu (1892). Les copépodes du Boulonnais. *Trav. Lab. Zool. mar. Wimereux*, VI, 1.

Dana (1852). U. S. Explor. Exped. during the years 1839 etc. Vol. XIII Crustacea.

Jungersen (1911). *Vidensk. Meddel. fras Naturh. Foren.* Vol. 64, p. 33.

Krøyer (1863). Bidrag til Kundskab om Snylterkrebsene. *Natur. Tids. Trediae Raekke*, Andet Bind 75.

Leach (1819). *Dict. des sciences nat.* XIV, 535.

Nordmann (1832). Erster Beitrag zur Naturgeschichte der *Lernaea. Mikrog. Beitr. Naturg. Wirbelthiere.* Pt. 2. p. 49.

Oakley (1930). The Chondracanthidae. *Parasitology* XXII, 185.

Rathbun (1886). *Proc. U. S. Nat. Mus.* IX, 315.

—— (1887). *Perissopus.* Ibid X.

Sars (1905). *Bull. Mus. Monaco* Nr. 26, p. 2 and 7.

Scott (1894). *Trans. Linn. Soc.* VI, 126.

Wilson. *Proc. U. S. Nat. Mus.* Washington:

—— (1904). Caligidae XXVIII, 479.

—— (1907). Euryphorinae XXXI, 669.

—— (1917). Lernaeidae LIII, 1.

—— (1919). Sphyriidae LV, 549.

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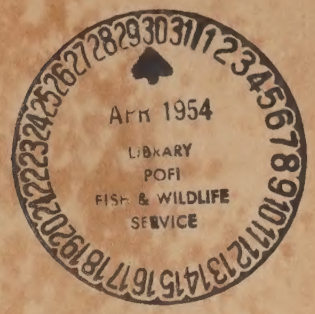
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